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TAMPERE UNIVERSITY OF TECHNOLOGY

ANIL ENGEZ  
STAKEHOLDERS CONTRIBUTING TO COMMERCIALIZATION OF  
A RADICAL INNOVATION AT GLOBAL MARKETS: A SINGLE  
CASE STUDY

Master of Science Thesis

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## ABSTRACT

**ANIL ENGEZ:** Stakeholders Contributing to Commercialization of A Radical Innovation at Global Markets: A Single Case Study

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Even though successful commercialization is of great importance to innovative firms, we do not yet know how diverse stakeholders can contribute to commercialization of a radical innovation that require particular market creation support. To explore this phenomenon and to develop the theory of the research field, this study aims to answer the following research questions: *Who are the relevant stakeholders that can contribute to commercialization? What kind of activities do stakeholders employ for effective commercialization? What are the motives of stakeholders to be involved in along commercialization? How stakeholders and their activities are interconnected?*

To answer these questions, a single case is analyzed, which is a functional food i.e. a novel product category between food and medicine at global market settings. The functional food product is a margarine that helps lowering cholesterol, which was invented by a food manufacturing company located in Finland. The case relies on qualitative interviews with regulatory bodies, doctors, opinion leaders, licensing partners, marketing managers and scientists as primary data source and extensive secondary data, which mainly consists of books and academic journal articles. Seven semi-structured interviews were conducted and all the interviews were recorded and transcribed by the author. The data is used to analyze the activities of diverse stakeholders that shaped the success of commercialization process of the innovation throughout the years. In addition to the activities, the motives and interests of the stakeholders for being involved in the commercialization process were also examined.

Results uncover the contributions by diverse stakeholders to commercialization and market creation. Stakeholders perform activities such as drafting new legislation and food labelling for health claims, conducting safety assessments, product development, finding out consumers' preferences, communicating benefits of the product to several actors for adoption, gaining the trust of healthcare professionals and patients, and revealing the positive health effects of the ingredient. The results indicate that the motives of such activities are ensuring well-being of people, creating new business ecosystems, contributing to the economy, and creating awareness among public towards a healthy diet and lifestyle, which facilitate the emergence of a market. This study contributes to marketing and innovation management literature and generates practical advice for managers who commercialize (radical) innovations.

## PREFACE

This thesis presents the stakeholder types, their activities, and their motives for being involved in the commercialization process of a radical innovation. I am grateful for having the chance to get to know wonderful people by means of this work, which made this research stand for an important stage in my life and made it an unforgettable experience.

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Tampere, 19.09.2018

Anil Engez

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## LIST OF SYMBOLS AND ABBREVIATIONS

EFSA	European Food Safety Authority
EU	European Union
EVIRA	Finnish Food Safety Authority
FDA	U.S Food and Drug Administration
IP	Intellectual Property
HDL	High Density Lipoprotein
LDL	Low Density Lipoprotein
MMM	Ministry of Agriculture and Forestry of Finland
NPD	New Product Development
R&D	Research and Development
SIG	Special Interest Groups
SLN	Shared Logic Nets
THL	National Institute for Health and Welfare of Finland
US	United States

# 1. INTRODUCTION

## 1.1 Background

Even though successful commercialization is of great importance to innovative firms, the topic has remained unstudied, as research and development (R&D) tend to attract more research interest (e.g. Driessen & Hillebrand, 2011). The increasing body of commercialization research has recently acknowledged that commercialization efforts by the innovator firm can be facilitated by diverse stakeholders who can support the adoption and set up markets for the novelty (e.g. Chiesa & Frattini, 2011; Aarikka-Stenroos et al. 2014). Commercialization is indeed a critical area in the innovation process (Chiesa & Frattini, 2011), and it highly affects the innovation success and performance. Commercial success of a new product highly depends on the approaches that are adopted by the company to commercialize it and launch it in the market (Schilling, 2005). Companies have to plan the launch strategy of a new product thoroughly and in advance. For a product, being technically and functionally superior to the competing ones does not always mean that it would also succeed in commercialization and market launch. (Hartley, 2005). A special effort should be put in these processes regardless of the technical success potential of the product. Effective use and active involvement of stakeholders determines the success of the commercialization and market launch of a new product (Aarikka-Stenroos et. al., 2014).

Chiesa and Frattini (2011) points out that impact of commercialization choices (timing, positioning, and choice of distribution channels) on the innovation's market performance has been largely neglected in previous researches. They remark that the variables that affect the success of commercialization of innovations are timing, targeting and positioning, inter-firm relationships, product, distribution, advertising and promotion, and pricing. According to them, companies operating in high-tech business usually fail in commercialization due to the lack of support from the innovation's adoption network and negative post-purchase attitude of the innovation's early adopters, which draws the attention on the need of more careful and systematic approach in commercialization processes that companies must employ.

Commercialization process of a new product or technology might take longer time than expected and it is usually not so common to see a product that achieved success on the first try (Lynn et. al., 1996). Commercialization is the least well-managed area of the innovation process and the emphasis is more directed on research and development activities (Cooper, 2011). Commercialization activities have importance as much as research and development activities and must be examined in detail for the market success



of a product. These activities must be conducted with networked market actors and new product must attract stakeholders for the diffusion of innovation in market (Talke & Hultink, 2010).

Many new organizations seek growth in international markets by expanding their activities abroad. Although expanding business abroad carries high risks due to the exposure to liabilities of foreignness and outsidership (Johanson and Vahlne, 2009), once it is executed carefully and planned, it has a huge potential for growth. In order to mitigate liabilities, companies should actively build and leverage network relationships to access and mobilize external resources in foreign markets (Coviello, 2006). Symeonidou et. al. (2017) state that based on the commercialization strategy that the company adopts, the level of the need to build these network relationships changes. This choice of strategy highly concerns the technology-based new ventures, whose business is based on creating and exploiting intellectual property (Onetti et al., 2012). There are three types of commercialization strategies a company can choose, which are product based, intellectual property (IP)-based, and hybrid commercialization strategies. Based on the findings of Symeonidou et. al. (2017), companies using IP based strategy are more likely to succeed in international markets due to the less cost and difficulty of accessing value chain resources abroad.

The requirement of learning about markets is building a diverse network of relationships with stakeholders (Musteen et al., 2014). Identifying and involving multiple stakeholders in commercialization activities is crucial as the support from them helps an innovation spread throughout the target markets. Hillebrand et al. (2015) emphasize the systemic perspective of a focal firm to see the contribution of single actors in stakeholder systems. Systems thinking aims to identify all the stakeholders in the system and to explore how single actors are interconnected (Vargo & Lusch, 2011). Furthermore, the studies on the effects of diversity of actors lacked attention especially in the development of collaborative innovation and rather it has been focused on strategy and organization, as well as the processes of innovation diffusion and implementation (Corsaro et. al., 2012). Even though the studies has discovered the actors who influence commercialization processes (Hult et. al, 2011; Kull et. al., 2016; Plouffe et al., 2016; Reypens et. al., 2016; Zeng et al., 2010), there is a need for a detailed empirical analysis of the relevance of diverse stakeholders along the commercialization and demonstrating the clear activities of actors around an innovator firm that contribute to commercialization, indicating the linkage of single actors within the system. In line with this need, this thesis will explore the different commercialization activities that takes place among various stakeholders such as regulators, individual parties, research organizations, licensing partners, opinion leaders, doctors, and marketing managers in functional food industry, which provides support and resources (Ritter and Gemünden, 2003). It will also analyze the motives, priorities, interests, and interactional goals of organizations.

## 1.2 Objective

In commercialization, there are various types of stakeholders with different expectations, who are interested in the development of a product. Stakeholders not only contribute to research and development, but also to the commercialization process of a product (Aarikka-Stenroos et. al., 2014). In order to be successful in markets, a strong collaboration among these stakeholders is needed. Companies must have access to resources, knowledge and relationships to gain a competitive position in domestic market or foreign markets (Denk et al., 2012). This is due to the need of utilizing the stakeholders for gaining credibility and creating awareness. This leads to the main question of the thesis...

*...How do different stakeholders influence the success of commercialization of an innovation?*

Main research question can be solved by answering these sub-questions:

- *Who are the relevant stakeholders that can contribute to commercialization?*
- *What kind of activities do stakeholders employ for effective commercialization?*
- *What are the motives of stakeholders to be involved in along commercialization?*
- *How stakeholders and their activities are interconnected?*

Stakeholders have different goals and expectations from participating in such relations. The goals might be revenue increase or improving well-being of communities. By understanding these goals clearly, innovator company would be able to know the involved stakeholders better and align its goals with their partners. Scientific research in the area of commercialization mostly focuses on the activities that stakeholders perform. This thesis focuses on a more comprehensive study on stakeholder motives and the interactions between them to better understand what aspects drive the stakeholders' involvement in commercialization processes. Thus the objective of the thesis is...

*...to understand why stakeholders intend to be involved in commercialization processes of a new product, to learn more about the activities they perform, and to analyze the interactions between these stakeholders during commercialization activities.*

To address this objective, this thesis applies a single case study in functional food industry in Finland and reviews the literature concerning commercialization, commercialization activities, functional foods, market strategy, market categorization, multi-actor approach, stakeholder types, and network collaboration. In order to answer the proposed research questions, it is more appropriate to focus on one focal organization and analyze the stakeholders around it that affect its commercialization outcomes. Single case studies, in particular, provide an empirically-rich, holistic account of specific phenomena (Yin, 2003). Therefore, single case study method lets us examine stakeholder activities in more detail

to capture the small details with qualitative analysis. In our research, single case study is a better approach compared to the multiple-case study that includes several organizations, which would have made the research more scattered. As the industries such as medical equipment or functional food involve sensitive content, the market launches of the products in these industries have difficulties in some countries regarding regulations as the health is a concern. For this reason, it also lets us include regulators and scientists in the research and study their activities and motives, which increase the stakeholder diversity in our study for providing different perspectives on commercialization activities. Since the functional food products caused controversies regarding the meaning of the functionality between food and medicine, it provides a distinctive base to study various stakeholders involved.

### **1.3 Structure**

The structure of the thesis is divided to six chapters to answer the research questions. Introduction is followed by theoretical background, research methodology, research results, summing up results and discussion, and conclusions chapters.

In the theoretical background chapter, definitions of commercialization and various commercialization activities are discussed. Furthermore, commercializing a functional food innovation, multi-actor approach in commercialization, different types of stakeholders, their relationship with each other in a network are explained in more detail. In the third chapter, research methodology of the study is presented. In results chapter, the data obtained from qualitative interviews that clarifies the relevant stakeholders in functional food industry, their activities and motives are presented. In fifth chapter, the summary of the results and discussion are presented. The last chapter concludes the thesis, demonstrates theoretical contribution, managerial implications, and limitations and future research. Table 1 below represents the paths to answer the main research question.

**Table 1.** *Structure of the thesis.*

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**Main Research Question:**

*How do different stakeholders influence the success of commercialization of an innovation?*

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**Theoretical Background:**

Sub-question 1: *Who are the relevant stakeholders that can contribute to commercialization?*

2.5 Stakeholders in New Product Development

2.7 Stakeholders That Influence the Diffusion of Innovations

Sub-question 2: *What kind of activities do stakeholders employ for effective commercialization?*

2.1 Definition of Commercialization

2.2 Commercialization Activities

2.3 Commercializing A Functional Food Innovation

Sub-question 3: *What are the motives of stakeholders to be involved in along commercialization?*

2.6 Business Networks in Commercialization

Sub-question 4: *How stakeholders and their activities are interconnected?*

2.4 Multi-Actor Approach in Commercialization

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**Research Methodology:**

Research design, data gathering, data analysis, introducing the case company, research process, evaluation of the research.

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**Research Results:**

4.1 Regulatory Environment

4.2 Scientists

4.3 Research Organizations

4.4 Experts as Opinion Leaders

4.5 Marketing Managers

4.6 Licensing Partners

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**Summing Up Results and Discussion:**

Summary of the research results, and providing answers to research questions.

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**Conclusions:**

Conclusions of the thesis, theoretical contribution, managerial implications, limitation and suggestions for further research.

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## 2. STAKEHOLDERS IN COMMERCIALIZATION OF INNOVATIONS

### 2.1 Definition of Commercialization

Commercialization involves all the activities that are performed with the aim of disseminating the innovation in the market or to several markets, and generating profits from it (Costa et. al., 2004; Crawford & Di Benedetto, 2008). It is a broad term that must be taken into account during innovation process. In the innovation process, commercialization activities should be performed concurrently with the research and development activities, in order to obtain a positive market response and to eliminate the market uncertainties (O'Connor, Ravichandran, & Robeson, 2008; Coviello & Joseph, 2012; Aarikka-Stenroos & Lehtimäki, 2014). In literature, there is a tendency to use the terms launch and commercialization for the same context in a new product development (NPD) process. In fact, these two words are not the same and their definitions are different. There is a need to use these definitions clearer to prevent any confusions and misunderstandings regarding the terms (Lehtimäki et. al., 2008).

Launch is more often related to new products, whereas commercialization is linked to new technologies, concepts and products. Launch is usually considered as the last stage of NPD and it is described as a step or an activity in NPD. Systematic approach of product introduction involves planning of marketing communication, internal trainings, global launch, and distribution (Lehtimäki et. al., 2008). By using the term “new product development”, it is emphasized that the focus of launch is on products, not on technologies. In order to use the technologies in the context of launch, there has to be a product application in relevance with the technology. Nevertheless, oftentimes launch refers to the product itself. It should be noted that when a product launch takes place, other products of the company might be cannibalized. A balance in focus between products must be ensured. It is suggested for companies to emphasize on the strategy to make the decision on which products to focus more, before the planning of launch phase.

In the development process of a product, decisions, technical activities and commercialization interact and evolve together (Prenekert, 2012). Aarikka-Stenroos & Lehtimäki (2014) state that commercialization and other activities of the innovation process are complementary, concurrent and mutually linked. They also point out that commercialization concerns the level of innovativeness of a technology and it takes into consideration how to bring novel technologies into profit making position and disseminating the innovation in the market. The level of innovativeness increases as the introduction of the innovation is related to a technology rather than the concrete product. Also, the time needed for ac-

tivities concerning product introduction is less and the processes are less complex compared to the technology introduction. In order to provide detailed definitions of commercialization, several viewpoints by various authors are listed in Table 2 below.

**Table 2.** *Definitions of commercialization.*

Author, Year	Commercialization Definition
Aghajani and Yazdanpanah, 2005	Commercialization is the process of transferring knowledge and technology from research centers to the industries and new businesses
Bhuiyan, 2011	Commercialization contributes to job creation, technology advancement, a higher standard of living and most importantly economic growth
Bozeman, 2000	Commercialization enables technology transfer through published articles or papers, patents, licensing, attracting technology, informal methods, human resource exchange, presenting technology at the place, and development of generative companies
Chiesa & Frattini, 2011	Marketing an innovation with the aim of converting it into a profit-making position in the marketplace
Costa et al., 2004	Entails both marketing strategy planning and subsequent implementation
Crawford & Di Benedetto, 2008	Conventionally refers to the moment of facing markets and disseminating the innovation
Guiltinan, 1999	Commercialization involves diverse strategic and tactical marketing tasks such as demonstrations, advertising, brand development, promotional events, organizing distribution, and gathering customer feedback
Hauser & Dahah, 2008	Commercialization assists companies to utilize economies of scale, to leverage their resources and to improve their reputation
Hultink et al., 1997	Internally consistent set of both strategic and tactical decisions that define how the new product is positioned and ultimately introduced into the market
Jolly, 1997	Commercialization comprises the development of the product/concept, its successful launch, and interaction activities with potential buyers that demonstrate its potential benefit
O'Connor et al., 2008	Commercialization is often conceptualized as a separate late stage/phase of the innovation process comprising the front end or ideation and technical development

These definitions all stress that commercialization involves a development process of an innovation, as well as marketing tasks and the product launch. It is pointed out that regardless of the success potential of the product innovation, all companies need support from their adoption network from different types of stakeholders to execute an efficient commercialization operation.

Challenges in commercialization such as technology innovativeness, customer behavior, and marketing (Costa et al., 2004) causes adoption barriers among customers (O'Connor, 1998) and stakeholders (Aarikka-Stenroos & Sandberg, 2012), and compels the firm to deal with stakeholders that the company is not familiar of (Garcia & Calantone, 2002). These challenges exist primarily due to technological, customer, and marketing discontinuities (Aarikka-Stenroos & Lehtimäki, 2014).

Technological discontinuity is caused by the introduction of new technological environment for operations, and new processes, which changes the product design and as a result, have an impact on the customer's consumption patterns (McNally et al., 2010). Customer discontinuity resulting in adoption barriers are mainly caused by difficulties of understanding the benefits (Veryzer, 1998), leading the customers to not knowing and not wanting (O'Connor, 1998). Marketing discontinuity represents the situations when companies start to operate in new marketing domains. This concerns the changes in product category, competitors, distribution channels, or customer base (McNally et al., 2010).

## **2.2 Commercialization Activities**

Commercialization activities of the innovator firm require high levels of involvement of the stakeholders. Therefore, the success of the commercialization is highly linked to the activities stakeholders perform (Story, Hart, & O'Malley, 2009). For a successful commercialization process, firms need to find a way to address the customer expectations in relevance with the innovation, build awareness in the market by effective promotion, educate customers and organize special events as well as trials (Aarikka-Stenroos & Sandberg, 2012). Companies need to acquire resources and have a broad knowledge of the new markets (Costa et al., 2004; Lynn et al., 1996; O'Connor et al., 2008) to make use of a potential opportunity of innovation in that market. The major commercialization activities can be considered as defining a marketing strategy, targeting, segmentation, positioning decisions and the identification of competitors (Costa et. al., 2004). Table 3 below shows different approaches in commercialization in literature presented by several authors and shows how networks are linked to commercialization.

*Table 3. Focus areas of commercialization.*

Author,Year	Research Focus	Approach in Commercialization
Symeonidou et. al.,2017	How Intellectual property based commercialization strategies allow new ventures to increase their international sales at a lower cost, due to the less need of having units abroad to perform tasks in different locations compared to the product based and hybrid strategies.	The emphasis is on building and leveraging network relationships to access and mobilize external resources in foreign markets.
Chiesa and Frattini, 2011	How commercialization decisions (i.e., timing, targeting and positioning, inter-firm relationships, product configuration, distribution, advertising, and pricing) can determine lack of support from the innovation's adoption network for systemic innovations and a negative post-purchase attitude of early adopters for radical innovations. Focus is on the actions that should be taken for improving the outcome of commercialization activities.	When commercializing innovations, focus should be on: 1) Positioning the product clearly and as a revolutionary technology instead of a product line of a successful brand to prevent early adopters from perceiving it as a downscaled version. 2) Avoiding the early preannouncement if the product configuration is not yet ready for launch. 3) Functionality of the product so that it can fulfill the commitments. 4) Forming long-term relationships with the network players that would have an impact on product diffusion.
Öberg & Shih,2014	Similar or different priorities, interests, and interactional goals (logic) of the companies in a network affect the development of the innovation and commercialization processes. Emphasis is on the convergent logic of companies in a network for the success of a novel innovation. It is proposed that parties need to be part of the same shared logic nets (SLN) for the innovation to be successfully developed, with the aim to overcome the conflicts in priorities.	To come to terms with divergent logic that may inhibit firms' ability to commercialize innovations, innovative firms either need to redefine their innovation goals to fit into the existing logic of others, or need to find incentives that talk to the interests, priorities, and interaction goals of other parties.
Slater & Mohr, 2006	Focus is on different market strategy types to whether choose a prospector approach and focus on emerging customer needs or defender approach and fulfil the needs of existing customers	In order to successfully develop and commercialize disruptive innovations, not only does the firm need to conceptualize and develop the innovation in the first place; it must also be successful in reaching more than just a niche market of innovators–early adopters. In other words, it must overcome the innovator's dilemma as well as cross the chasm.
Perks & Moxey, 2011	How task partitioning and resource sharing practices, and their evolution over time are related to the nature and scope of capabilities of lead firms within the context of market-facing innovation networks.	A relational approach distributes innovation and commercialization capability around the network. It can enable companies to rely on external partners to access resources and capabilities, and also can boost the innovativeness of these partners.



Aarikka-Stenroos & Lehtimäki, 2014	A dynamic process model for the commercialization of radical innovations and the challenges a firm face when probing its way to the market and how to cope with these challenges	Commercialization process involves continuous experimenting and iterative probing between strategic zone, market creation and preparation zone, and sales creation and development zone. The importance of market creation and preparation zone shouldn't be ignored.
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Kern (2001) remarks that companies commit to different activities with the intention to increase their monetary wealth. Firms allocate their resources to perform activities to meet their various interests and priorities. The question of what activities are performed and how they are performed can be asked. The decisions that determine the activities are made based on the combination of resources, competences, interests and priorities (Nielsen & Parker, 2012). They state that interests and priorities determine the firm's unique motivation. The trust and commitment can be observed between the network parties as the interaction develops (Ford, 1980) but still, firm's motivations will be the main element that have a role on the interaction goals (Öberg & Shih, 2014).

In a network, firms tend to pursue their own interests and goals instead of performing activities that benefits the whole network (Corsaro & Snehota, 2011), which inhibits the collaboration, as the motives of venture firms and investors might be conflicting (Masulis and Nahata, 2011). It is expected that companies might differ in terms of the goals and directions, but in some cases there is a need to cooperate in certain capacities (Wilkinson et al., 2005). They point out that, partner selection is affected by the close relationship of the parties, which has an impact on having the similar goals, interests and priorities. However, Corsaro and Snehota (2011) state that even though the parties may have a match regarding resource needs, if they employ different logics, relationships may fail.

Chiesa & Frattini (2011) point out that in radical innovations, the right positioning strategy determines the effectiveness of communicating the product value and product's use areas to provide a clear understanding on how the product actually benefits the customers. Positioning the product as a revolutionary innovation that is different from its competitors is more effective than declaring the product as a continuation of a product line of a well-known brand. Special efforts should put on fully completing the product development to make the product configuration ready for launch, as well as the consistent, not contradictory preannouncement of the product features and avoiding announcing the features that are not finalized, which are the main aspects for early adopters to purchase the product. As the preannouncements are used to communicate with customers to increase the speed of the diffusion and draw customer interest (Eliashberg and Robertson, 1988), a consistent, reasonable and honest information flow is needed.

The literature on commercialization of innovations shows that two types of variables determine the market success or failure, which are strategic and tactical variables (Hultink

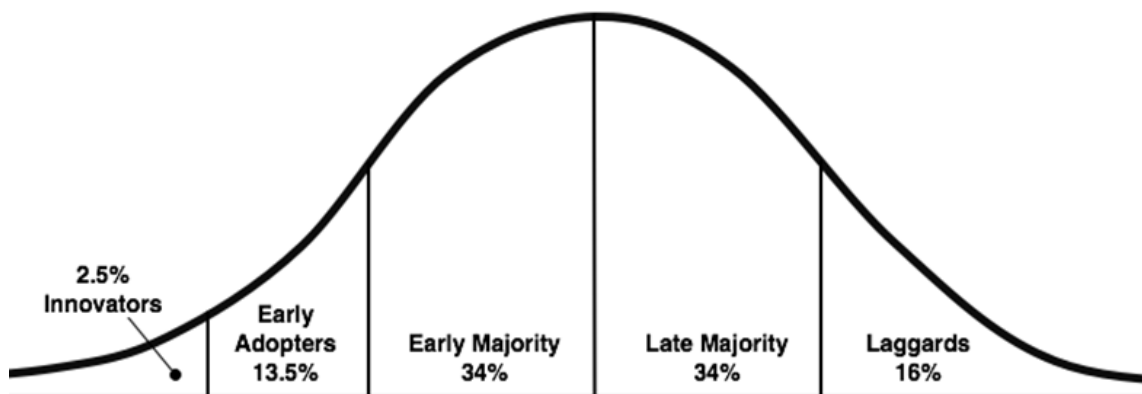
et. al., 2000). The strategic decisions are assessed and made prior to the start of the development, while tactical decisions comprise the marketing mix (product, price, place, promotion), and are considered during the development (Chiesa & Frattini, 2011). These variables are listed in the table below. For each variable, an example of an activity is given that helps the achievement of market success of the innovation with the aim of receiving positive response from the early adopters and the extensive support from the adoption network depending on the type of the innovation. Table 4 below is created based on the research in radical and systemic innovations in high-tech industries (Chiesa & Frattini, 2011).

**Table 4.** *Variables that affect commercialization decisions (Adapted from Chiesa & Frattini, 2011).*

Type of Variable	Variable	Activity	Innovation Type
Strategic	Timing	<ul style="list-style-type: none"><li>Timing of the innovation's preannouncement and launch should be well planned and the gap between shouldn't be too long</li></ul>	Radical
		<ul style="list-style-type: none"><li>Long-term partnerships should be formed prior to the diffusion in the market</li></ul>	Systemic
	Targeting and Positioning	<ul style="list-style-type: none"><li>Positioning of the innovation as a revolutionary technology</li></ul>	Radical
		<ul style="list-style-type: none"><li>Targeting the new product at any specific segment immediately after launch</li></ul>	Radical
		<ul style="list-style-type: none"><li>Configuring and positioning the product in a way that meets early adopters' expectations</li></ul>	Radical
	Inter-firm Relationships	<ul style="list-style-type: none"><li>Establishing relationships with critical players in network</li></ul>	Systemic
<ul style="list-style-type: none"><li>Licensing of technology to complementary product developers for a low price or for free</li></ul>		Systemic	
Tactical	Product	<ul style="list-style-type: none"><li>Product functionalities should address the expectations of early adopters</li></ul>	Radical
		<ul style="list-style-type: none"><li>The complete set of product functions should exist as it is presented at the preannouncement campaign and work properly at the time of the launch</li></ul>	Radical
		<ul style="list-style-type: none"><li>Use of the product should be simple and easy to understand. It shouldn't contain complex functionalities</li></ul>	Radical
	Advertising and Promotion	<ul style="list-style-type: none"><li>Focus on preannouncement campaign should be on product's technical capabilities instead of promoting it as the continuation of the product line of a successful brand</li></ul>	Radical
		<ul style="list-style-type: none"><li>Product configuration at launch and at the pre-announcement campaign should be consistent</li></ul>	Radical
	Pricing and Distribution	<ul style="list-style-type: none"><li>Late adopters may find pricing and distribution channels critical, as these factors are not a concern to early adopters and the adoption network</li></ul>	Both

The success of a commercialization decision of new innovation is highly dependent on the customer acceptance, financial performance, technical and functional performance of the product and contribution to the firm's competence base (Cooper and Kleinschmidt, 1987; Griffin and Page, 1993). Therefore, planning of activities should be made, taking into account the customers purchase behavior, their expectations and needs, products technical capabilities and its readiness level for product launch, information consistency of preannouncement campaigns, and the importance of building relationships with critical partners. Timing of setting up the relationships is essential in a commercialization process. It is suggested that the companies should start building up relationships in advance and constantly ask feedbacks, work with partners and share resources (Perks & Moxey, 2011).

According to Rogers (1995), customer segments split into five types in diffusion of innovations, which are innovators, early adopters, early majority, late majority, and laggards. For an innovation to be successful, adoption and diffusion from one category to another are needed. Each of these adopters have different buying needs and thus innovator firms need to find ways to disseminate innovation throughout the segments. As the diffusion starts with innovators and lead users, which is also one stakeholder group that influence the commercialization of an innovation, their contribution and adoption has the highest effect on the following chain reaction of adoptions from the next segments. Innovators are the initiators of the mass adoption of an innovation throughout the markets. As the segments start to use the innovation and the shifts become more obvious from one segment to another along the process, the commercialization efforts on the innovation should be increased. Bell-shaped curve of the diffusion of an innovation is illustrated in Figure 1 below.



**Figure 1.** Customer segments in diffusion of innovations (Rogers, 1995).

Innovators are the technology enthusiasts who are aware of the latest technologies that want to use it promptly. They are not price sensitive and they are capable of developing solutions to a problem that might occur in an innovation that is recently launched in the market. Next, early adopters are also aware of the technologies, but they are not as com-

petent as innovators. They intend to find new use areas and confirm the usability of technology. After these two segments, a chasm area forms. According to Moore (1991), this area exists because the marketing strategies that firms use to reach the early market for technology innovations do not address the different needs of the mainstream market. Next, early majority crowds can be seen which are not technologically aware. They want ease of use and solutions that meet their needs. Price sensitivity also comes in with this group of customers. Next, in late majority category, market becomes more price sensitive and more simplistic solutions are needed. The last category is laggards who compare everything in the market and want the cheapest solution of a need.

As mentioned before, chasm area is between the early adopters and the early majority. The area that corresponds to the innovators and early adopters segments before chasm represents the customers who are more technologically oriented. Once the innovation penetrates through the mass markets after chasm, the emphasis and activities should be more on the marketing and pricing side instead of the technological features of the innovation (Rogers, 1995). Many companies miss this distinction of chasm that divides the customers into two simple categories who wants new technologies and the customers who wants to fulfil their needs.

Slater & Mohr (2006) argues that company's capability to successfully commercialize a disruptive innovation depends on its selection of the target market and how well the company modifies its initial marketing approach to address the mainstream market, as well as their strategic orientation to whether focus on existing customer needs (sustaining innovations) or emerging customer needs (disruptive innovations). Miles and Snow (1978) state that companies may choose one of the following strategies to approach their product-market domains. Prospectors focus on exploiting new products and market opportunities that help disruptive innovations diffuse in market. Defenders pursue addressing a particular portion of the market to create a stable set of products and customers, which helps sustaining innovations to have a strong position in the market. Lastly, analyzers both seek new products and markets, and also maintain a stable set of products and customers. Prospectors more likely get positive results by targeting the innovator and early adopter segments, whereas for analyzers these results are obtained by targeting the early adopters and early majority segments, which makes prospectors more capable of developing disruptive innovations.

According to Slater & Mohr (2006), market-share leaders tend to be analyzers and defenders because those strategy types target the early and late-majority segments of the market comprising approximately two-thirds of market demand. They suggest that companies should develop skill sets of each strategy type and need more proactive approach to developing customer knowledge to address the needs of broader range of customer segments. Prospectors should develop some of capabilities of analyzers and defenders

and vice versa. Different findings from various researchers (Slater and Olson, 2001) remark that different strategy types have different resources and capabilities for targeting different market segments.

Christensen and Bower (1996) point out that the companies that focus too much on their existing customers are not capable of coming up with a disruptive innovation and they lose their industry leadership position, due to the missed opportunities that new markets and customers might bring. In one of Christensen's research (1997), it is said that a new technological innovation introduces new features, performance, and price attributes, which may have a higher customer perceived value relative to the existing technology and cause the discontinuity of existing technology. He also argues that because of listening too carefully to the customers, companies are disrupted by industry newcomers that address emerging customers. Additionally, the study of Govindarajan and Kopalle (2004) showed that, focusing on emerging customer segments rather than mainstream customers provided a higher capability of developing disruptive innovations. Slater & Mohr (2006) point out that customers do not know or are not aware what they want until some technology provider manufactures and shows the innovation to them. Until the point they see the innovation, they are not dissatisfied either, because they were not aware of that need. This is also one of the examples of how emerging customer segments appear. Innovator companies should speculate what the potential customers may be in need in the future and come up with a revolutionary technological innovation that customers would value. According to Slater & Mohr (2006), customer-visit programs, empathic design, lead-user research, end-user (customers of customers) research, and targeting developing markets are the sources of new information that may have influence developing new innovations.

### **2.3 Commercializing a Functional Food Innovation**

In this chapter, management and marketing approaches, challenges in innovation activities and positioning, consumers' perception about functional foods, actors that influenced the progress of innovations in functional food industry, which correlate with the case study of the thesis are discussed. As the functional foods became popular in the end of 1990's and the term 'functional' became a buzzword that has been used by many food producers on their products without any specific scientific study that backs up the functionality claim, the need arised for regulating the claims made by food producers (Granqvist & Ritvala, 2016). Strict rules and regulations were applied, which was needed to ensure the safety of the food products that carries no risks on health. However, this brought difficulties to innovator companies for entering to a new market category. Companies needed to put more efforts and resources to obtain the right to put the health claim labels on their products, which resulted in relatively delayed product launches in various markets. Regarding the health claims on food products, one important thing to point out is that in a survey carried out by Mintel in 1999, it was seen that 77% of 922 adults that

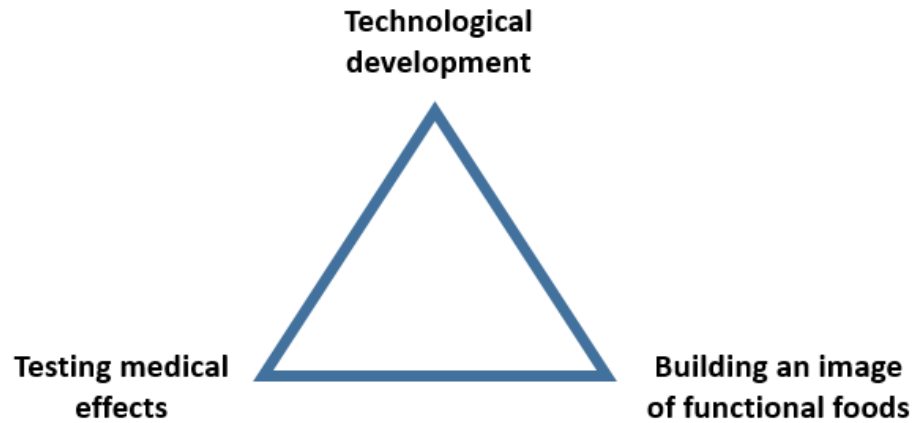
were surveyed believe that health claims made by food manufacturers about their products are misleading. For widely recognized health positioning, this brings up the question whether companies that want to enter to the market should put more efforts on the health claims or on the skillful communication campaigns to raise consumer awareness of product benefits.

In food and drink industry, historical studies (Earnst & Young and Nielsen, 1999) showed that innovative products accounted for only 1.4% of the new product activity that was launched in a 13 month period in the countries the study took place, while the copied products accounted for 76.7% of the new product launches, which had a huge failure rate. The innovation activities apparently are much lower in food and drink than in other industries. Mellentin and Heasman (2001) argue that this is due to the fact that food and drink industry has a low-tech business environment, takes a longer time for a product to be profitable if succeeds, and differentiation of the products are difficult to achieve because they are easily imitable by competitors. The previous study (Grunert, 1998) showed that the ratio of the innovation activities over new product activities in electronics, pharmaceutical, and food industries is the lowest in food industry, which can be seen in Table 5 below.

**Table 5.** *Innovation activity over new product activity ratios in 3 industries (Grunert, 1998).*

	<i>Electronics</i>	<i>Pharmaceutical</i>	<i>Food</i>
Denmark	12.7	18.0	1.2
France	n/a	31.7	1.6
Germany	15.6	16.0	1.2
Japan	18.4	13.0	2.0
Sweden	33.2	41.2	1.8
UK	22.9	22.6	1.0

Since the overall view of the innovation activities in food industry is dramatically low, functional foods provide a new market category which would increase the innovation activities of the companies and might give strength to a relatively low tech industry. Businesses that want to succeed in this market will have to find new ways of management practices, particularly in identifying critical technologies (Mark-Herbert, 2004). It is pointed out that companies should come up with a strategy that combines market pull and technology push, and 3 crucial requirements are underlined to advance in functional food industry, which is illustrated in Figure 2 below. To some extent, Benecol acted as a spearhead and a leading example of an innovation in the functional food industry with its patented ingredient and scientific research.



**Figure 2.** Requirements to advance in functional foods industry (Adapted from Mark-Herbert, 2004).

One challenge in commercializing functional food is the recent consumer shift to the organic products. The positioning of the organic products done by natural food companies has been attracting consumers more than the functional foods in general. In an observation made by Mellentin and Heasman, it was pointed out that while mainstream food companies are focusing more on the health improving and curing aspects of the products, the natural food companies has taken over and changed the mindset of the consumers to shift to the organic food products. Organic products has been perceived as healthier option in contrast to functional foods that is packaged and mass marketed (Mellentin and Heasman, 2001).

For systematic and effective diffusion of functional foods, scientists played a key role on the processes. They were the ones who convinced the top management to invest in the new market category (Granqvist & Ritvala, 2016). In particular, the scientific contributions from Helena Gylling and Tatu Miettinen led to the discovery of positive health effects of plant stanols on cholesterol reducing effects and played an important role on Benecol's awareness creation around the world. Their scientific studies also helped Benecol to obtain the right to use the necessary health claims from regulators to reach consumers in various markets.

There are several strategies and marketing approaches that companies can choose when commercializing functional foods. Choices should be made on particular points and the success of the selected strategy depends on the market condition, product type and how consumers perceive the products. In all these situations, consumer communication is essential to build an image of functional foods. These strategies include applying a regular pricing or premium pricing, cannibalization of the other products in the product range or incremental business, targeting the mass market or niche, targeting a disease healing feature or well-being, and launching the product with a health claim or without (Mellentin and Heasman, 2001).

## 2.4 Multi-Actor Approach in Commercialization

In order to better understand how the commercialization activities advance over time, a multi actor approach is evaluated and the impacts of different stakeholders around the innovator firm that influences the commercialization process are assessed. A successful commercialization of an innovation requires collaboration among several actors (Aarikka-Stenroos, Sandberg, & Lehtimäki, 2014). Partners with complementary types of scientific and practical competences must work together in the commercialization activities from beginning to end. Therefore, the relationship between these multiple actors are studied and assessed. In Table 6 below, three common multi-actor approaches in commercialization and their research focus are explained.

**Table 6.** *Multi-actor approaches in commercialization.*

	Stakeholder Approach	Network Approach	Ecosystem approach
<b>Author,Year</b>	Driessen & Hillebrand, 2013; Talke & Hultink, 2010; Freeman, 1984	Öberg & Shih, 2014; Symeonidou et. al.,2017; Denk et al., 2012; Musteen et al., 2014; Coviello, 2006; Perks & Moxey, 2011; Law, 1992; Aarikka-Stenroos & Lehtimäki, 2014	Chiesa and Frattini, 2011; Moore, 1996; Iansiti & Levien, 2004
<b>Research Focus</b>	Focus is on managing and involving all the stakeholders, relationships and their interests for ensuring the long-term success of the focal firm, its stakeholder integration capability, and the achievement of its objectives.	Emphasis is on building and leveraging network relationships to access and mobilize external resources to gain a competitive position in markets. Task partitioning and resource sharing in market-facing innovation networks are of importance. Shared logic nets (SLN) and convergent logic of companies in a network affects success of a novel innovation, with the aim to overcome the conflicts in priorities.	Focus is on interaction of customers, distributors, legislators, experts, and complementary products that develops a firm's understanding of the benefits for adoption from the customers' and stakeholders' perspective.
<b>Approach in Managing Actors</b>	Using stakeholder issue identification techniques, coordination mechanisms, and prioritization principles for developing a capability for stakeholder integration. Addressing non market stakeholder issues with regards to the environmental impacts and keeping these green issues on the agenda.	To come to terms with divergent logic that may inhibit firms' ability to commercialize innovations, innovative firms either need to redefine their innovation goals to fit into the existing logic of others, or need to find incentives that talk to the interests, priorities, and interaction goals of other parties. An actor in a central position in the network can orchestrate other actors towards a goal.	Educating customers, creating an active supportive network of divergent stakeholders, scaling up production and distribution networks, integrating the innovation into the mainstream business and production setting, inspiring the whole value chain and complementary market actors.



Stakeholder approach suggests that managers need to come up with processes which benefit all and only those groups who have a stake in the business. The main point of the process is to manage and involve all the stakeholders, relationships and their interests for ensuring the long-term success of the firm and the achievement of the organization's objectives. This approach requires active management of the business environment, relationships and the promotion of shared interests (Freeman & McVea, 2001). Stakeholder concept is used in multi-contextual applications, and it is subject to many different interpretations depending on the attributes of the context (Miles, 2017). According to Stoney and Winstanley (2001), the multitude of conflicting views caused substantial confusion. Failure to recognize and map this diversity of definitions and views weakened the stakeholder concept. Many scholars (Crane and Ruebottom, 2011; Fassin, 2009; Sternberg, 1997) argue that the definition of the concept is ambiguous, confusing, and contested. Improper use of the term might cause it to become another buzzword in literature. Sachs and Maurer (2009) point out that stakeholder-organization relationships can be analyzed from the management point of view, the stakeholder or both. For a stakeholder to be recognized, there must be a stake, right, or interest (Miles, 2017).

Stakeholder approach aims to study the interests and goals of the organizations in participating in the commercialization activities from the integrated stakeholder perspective, having a stake in the relationships. Rather than separate strategy for every stakeholder, managers must find ways to satisfy multiple stakeholders simultaneously (Freeman & McVea, 2001). Luoma-aho and Paloviita (2010) argue that the environment in which corporations operate today do not only consist of human interactions, but also different technologies, infrastructures, and political agendas. It is argued that these non-human entities can be also considered as stakeholders, which can turn unexpected individuals or groups into important stakeholders. According to Phillips, Freeman, and Wicks (2003), stakeholder theory addresses morals and values explicitly. Apart from maximizing shareholder wealth, managing for stakeholders implies attention to several things. They state that interests and well-being of those who can assist or hinder the achievement of the organization's objectives are critical. They point out that in this way, stakeholder theory is similar in large degree with alternative models of strategic management such as resource dependence theory.

Network approach challenges stakeholder theory to include all the different elements of society that are linked. Constant support from every member of the network is a necessity accordingly. This approach connects the whole network chain actors such as regulators, manufacturers, universities, customers, provides a full interaction and creates an extensive dynamic setting. Network approach differs from stakeholder approach by shifting from corporation-centered approach to the various networks in operation in society. It emphasizes the importance of the activity in the operating environment and actively monitoring this environment. Issues management is also of concern in network approach, as

many of the networks are formed around issues, not the corporation or stakeholders. Corporate communications are essential for keeping people involved, achieving a community mindset and avoiding corporate crises in network approach (Luoma-aho and Paloviita, 2010). It is stated that actor-network theory is a relational and process-oriented sociology that treats agents, organizations, and devices as interactive entities. It suggests to treat different materials such as people, machines, ideas as interactional entities rather than primitive causes, and the social effects of each should be explored in this approach (Law, 1992).

Business ecosystem is an economic community supported by a foundation of interacting organizations and individuals, and it is based on core capabilities, which are exploited in order to produce the core product (Moore, 1996). Promoting the health and the stability of a firm's ecosystem depends on the firm's role within the network. Developing a strategy to be a niche player, a keystone, or a dominator determines the firm's position in the ecosystem and ensures the firm's well-being. Most companies today exist in ecosystems that consists of networks of suppliers, distributors, technology providers and other organizations that affect, and are affected by the creation and delivery of a company's own offering. The actions that a company take in an ecosystem eventually affect its business network, which result in changes in the organization's performance. Therefore, firms must pursue strategies that will benefit everyone in the network, as their fate depends on each other's activities. It is stated that the health of the ecosystem suffers when a specific business utilizes more value than it creates. The role of the organization might change as the ecosystem changes, thus understanding the ecosystem and planning the next strategic moves to select the business partners for long-term success is essential (Iansiti & Levien, 2004). Peltoniemi and Vuori (2004) state that in business ecosystems, there is both competition and cooperation.

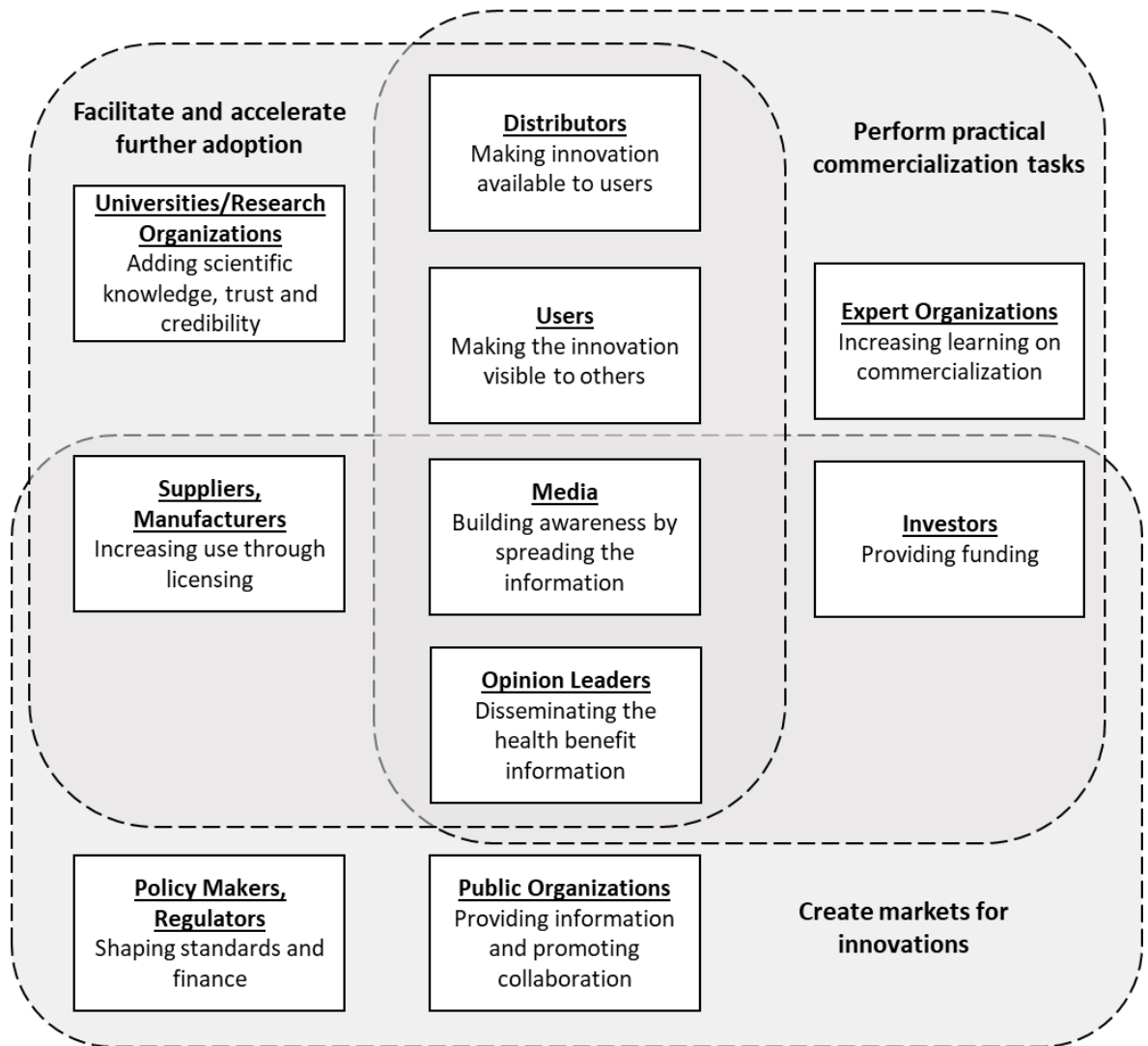
As a conclusion, the focus on one individual party increases as the approach moves from ecosystem to network approach, and from network to stakeholder approach. In stakeholder approach, the focus is more on managing the stakeholders for the long-term success of the focal firm, while in network approach the focus is on leveraging network relationships to access and mobilize external resources. In ecosystem approach, the aim is to improve the well-being and the current state of the ecosystem members in a broad context. Every member of the network cooperates for the benefit of the ecosystem they are involved in. The balance between value creation and value utilization in an ecosystem should be well managed to keep the members of the ecosystem motivated and to maintain the core competences.

In the next chapter, the definitions of different types of stakeholders, the broad network of actors, and their relation between each other will be discussed.

## 2.5 Stakeholders in New Product Development

Stakeholders are defined as any group or individual who can affect or is affected by the achievement of the organization's objectives (Freeman, 1984). The stake that stakeholders have is that they stand to gain or lose something from the organization's success (Driessen & Hillebrand, 2013). They point out that to process the market information about stakeholders, external environment can be utilized. This information then can be used to improve stakeholder theory by considering how information is integrated in new product development. Stakeholder theory emphasizes the importance of the environment along with shareholders. Greenley and Foxall (1998) clarifies that organizations that have more information about the stakeholders in the environment have higher organizational performance. According to Miles (2017), stakeholder concept is a contested concept in practice and it is open to many different interpretations. It is possible to generate many definitions depending on the ideology and social positioning of the person who defines the term.

Stakeholder theory describes defining the relevant stakeholders of a company and the conditions in which managers consider these parties as stakeholders (Phillips, 2003). It also considers the stakeholder integration in organization's decision processes (Hart, 1995). Stakeholders are defined as employees, the mass of users and customers (lead users, boundary spanners, opinion leaders, communities), suppliers, manufacturers, media, universities, public organizations, expert organizations, investors, financiers, competitors, communities, policy makers, regulators, governmental bodies, political groups, trade associations, trade unions, and complementaries (Aarikka-Stenroos, Sandberg, & Lehtimäki, 2014; Miles, 2011). Diverse actors with their main and individual contributions to the commercialization process are illustrated in Figure 3 below.



**Figure 3.** Diverse actors grouped by main and individual contributions to commercialization (Adapted from Aarikka-Stenroos et. al., 2014).

Aarikka-Stenroos et. al. (2014) indicate that stakeholders make three types of main contributions to commercialization processes, which are creating markets for innovations, facilitating and accelerating further adoption, and lastly, performing practical commercialization tasks. Activities for creating markets for innovations do not directly support a product or organization, but strengthens the market conditions and build the base and environment for innovations to diffuse easier. Some actors that perform activities for market creation are regulators, investors, media, public organizations, suppliers and manufacturers. Activities for facilitating and accelerating further adoption includes influencing the attitudes and choices of the critical mass. These tasks are done by universities, media, users, suppliers, distributors and other complementary organizations. And the last contribution to commercialization process, which is performing practical commercialization tasks, is vital for the innovator company and it is done by distributors, users, media, investors, and other organizations. Commercialization tasks involve spreading information about the benefits of the innovation, delivering

innovations and enabling its distribution to the users, and providing monetary resources. As the activities move forward from creating markets to facilitating adoption, and from facilitating adoption to performing commercialization tasks, the contribution of the stakeholders shifts gradually from indirect to direct, and from unintentional to intentional. Some of the indirect contributors can be considered as associations, public organizations, expert opinion leaders, and regulators, whereas the direct contributors are described as distributors, complementaries and investors (Aarikka-Stenroos et. al., 2014).

Every stakeholder has contribution in the commercialization process. Consumers and users support the communication of the innovation among the user networks, spread word-of-mouth, demonstrate the use cases, give feedback on market structure and product quality, present benefits and act as a critical mass of adopters (Perks and Moxey, 2011). Lead users are ahead of the mass market and speed up the information flow. They assess if the product features meet the user needs and they propose adjustments. Communities of users create public awareness by organizing conferences, seminars and discussions. They also assess the product features to acknowledge that it meets the end user requirements (Hienrich and Lettl, 2011). Distributors make the innovation available to users by delivering them (Perks and Moxey, 2011). Suppliers and manufacturers implement applications and use licensing to increase the usage. Expert organizations consist of designers, engineers, and consultants, which increase organizational learning on commercialization (Story et al., 2009). Complementaries promote the use of the innovation by developing new business fields, and requiring their clients to use the innovation. Partnerships with complementaries increase the reputation and credibility of innovator company and make it easier to reach higher number of customers due to the higher size of the installed base and the variety of complementary products (Perks and Moxey, 2011). Granqvist and Ritvala (2016) remark that public funding agencies act as important market makers that often have a major incentive to establish growth in a market category. Investors help innovators to find companies seeking to fund. Pontikes (2012) states that venture capitals and firms that introduce novel offerings create new markets and new niches. Public organizations and non-profit organizations promote the use of the innovation in society and build relations with governmental bodies. Trade and professional associations disseminate information and build trust for the innovator company. Members of these associations are from different sectors, thus they can help to weaken the negative biased perceptions about the innovation (Aarikka-Stenroos and Sandberg, 2012). Universities and academics build trust by researching and acknowledging the benefits with scientific proof (Bercovitz and Feldman, 2011). Policy makers, regulators or governmental bodies shape the standards that affect commercialization. Policy makers provide financial resources by funding individual projects. These institutions play an important role on networking of actors and help them start new collaborations to strengthen the clusters (Story et al., 2009), which are geographic concentrations of interconnected companies in a particular field (Porter, 1990). The media builds awareness by delivering the latest updates and developments about the innovation and the company to the audience

(Aarikka-Stenroos and Sandberg, 2012). Lastly, all players of the industry and collaboration between them form the industry structures and create push and pull mechanisms of markets (Chiesa and Frattini, 2011).

According to Granqvist and Ritvala (2016), although previous research in market categorization showed that prototypical similarity is the main driver of categorization, it misses to remark the importance of evolving perceptions, goals, and knowledge of the network actors, which have a role in determining categorization. Their longitudinal case study in market categories of functional foods and nanotechnology in Finland revealed that goal-based categorization is vital for the permanence of the categories in the market, rather than the causal-based categorization. They point out that dynamic market categories are continuously changing over time naturally, and apart from prototypical similarity, actors' goals and interests have an impact on that change. It is also stated that the similarity of technology, resources and customers, are the only drivers of market categorization (Hsu, 2006; McKendrick et al., 2003). In functional food category, scientists were the major actors that contributed to the creation of that particular category by influencing the regulators and spreading knowledge in the environment. Over the years, the requirement of causal relationship between the consumption of a functional food and the claimed health benefit diminished the possibilities for goal-based activities. Regulators applied strict rules that limited the potential for goals-driven participation, which led to the mature period in that market category. Since the statistical methods used in research of a functional food were the first ones of its kind, the regulators were not familiar with it and they invalidated the research, which caused the innovator company to be not legally permitted to use a health claim (Granqvist and Ritvala, 2016). Regulators require a link between a product and a positive health effect of that product, which is a causal-based model, and they consider that as a reference for category assessment and boundary drawing. These examples show that in functional foods, strict rules and regulations inhibited the growth of the market category, and discouraged the new entrants for entering the market.

It is emphasized that commercialization network indicates innovators' perspective, while adoption network indicates other stakeholders' perspective. It is also stated that for radical innovations, the support from diverse actors for research and development is essential as the decisions affect many interrelated actors. The organizations that develop radical innovations should also have advanced networking capabilities, as the networks are more likely created, abandoned, and reformed quicker in radical innovations than in incremental innovations. Aarikka-Stenroos and Sandberg (2012) state that when trying to get support from prospective contributors, small firms may face obstacles due to their relatively lower size and novelty. This is an important issue for small innovator companies as the actors surrounding them would convey knowledge and resources that facilitates commercialization, and these actors are often interconnected with each other, which creates an interactive dynamic network.

Market and non-market stakeholders are players that have an impact on the management decisions in new product development. Market stakeholders are considered to be the ones that are directly involved in the product market and have a role on an exchange, which are customers, competitors, suppliers, and retailers. Non-market stakeholders are the ones that are not directly involved in that type of an exchange, which are regulators, employees, and special interest groups (SIG) such as Greenpeace (Driessen & Hillebrand, 2013). Donaldson and Preston (1995) state that managers are type of a stakeholder, but these managers' responsibility also includes determining other stakeholders that are related to the company.

In the study that Driessen & Hillebrand (2013) conducted, multiple stakeholder issues in new product development were brought up. In that study, they stated that there are several stakeholder issue identification methods that an organization can use, which helps organizations to also identify the issues of the non-market stakeholders. As they are the ones that brings environmental issues forward, focusing on and identifying non-market stakeholder issues tend to bring green issues into the NPD process that often conflict with other stakeholder issues, which creates tensions. The issues of non-market stakeholders matter, since they are related to the environmental aspects of the processes or production, which are not the main concerns of the market stakeholders. Nonmarket stakeholders are, increasingly so, part of the environment in which NPD teams operate, and need to be considered in NPD decisions. Therefore, it can be said that addressing nonmarket stakeholder issues means the coordination and prioritization of green issues, which are the main reason of the tensions that occurs between stakeholders (Driessen & Hillebrand, 2013).

Some examples of structured techniques to identify nonmarket stakeholder issues are setting up international monitoring system to observe regulatory updates and continuous dialogue with SIGs to understand the environmental impacts of activities. After identifying the issues, comprehensive stakeholder management system and various guidelines, norms, and procedures can be used, concerning the inclusion of green issues in the NPD decision-making process. In order to manage the tension between stakeholders, coordination mechanisms are used, which range from formal to informal. Formal ones are the written instructions to include green practices, whereas informal ones are the regular discussions in NPD meetings. These mechanisms are established to not to skip green issues in NPD project discussions and including them in firm's agenda. Later, to ensure that green issues are one of the main concerns, several prioritization principles can be employed to assess green issues with other issues (Driessen & Hillebrand, 2013). Consequently, to develop a capability for stakeholder integration, three components are essential: stakeholder issue identification techniques, coordination mechanisms, and prioritization principles (Leonard-Barton, 1992). Driessen & Hillebrand (2013) remark that higher proactivity of environmental management and environmental impact of the industry may affect the development of stakeholder integration capability positively. This

capability increases organizational identification and may result in stakeholder resources, which means helping the organization by sharing knowledge or buying its products (Maignan and Ferrell, 2004).

As diverse stakeholders are involved in innovating, it complicates interaction by increasing a mismatch in actors' goals, which leads to conflicts and uncertainty (Aarikka-Stenroos & Sandberg, 2012). Firms can mobilize or influence other actors through relationships to achieve their goals (Mouzas & Naudé, 2007). Research has showed that radical innovations induce new markets and relationships, thus changing the network structure, compared to incremental innovations (Aarikka-Stenroos et. al., 2017), which means radical innovations require network visioning whereas incremental innovations require involvement of network actors. Recognition of these actors' interests when inducing changes in the network is essential for managing the network (Medlin, 2004). Eventually, networks can help companies to eliminate challenges they might face throughout the commercialization process of an innovation. Next chapter will discuss the network aspect in more detail and provide an overview of the importance of the mutual goals, interests and priorities among these network actors for an innovation to be successful.

## **2.6 Business Networks in Commercialization**

Previous study (Aarikka- Stenroos & Sandberg, 2012) showed that networks can offer complementary resources to support commercialization activities of innovations and provide the required environment for an innovation to diffuse. They state that, utilizing networks might provide cost savings to the small innovator companies which lack resources to reach customers, and interaction between these network players are important particularly in the functional food industry (Matthyssens et al. 2008). Additionally, networking capability and gaining the trust of the organizations of a network are critical for innovator firms for resource expansion to reach out customers easily.

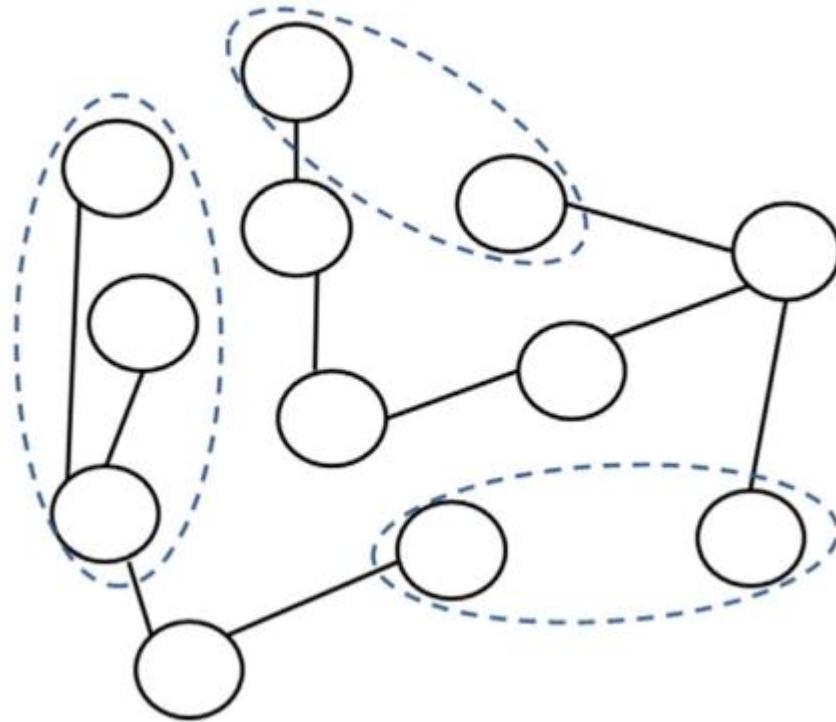
Business networks refer to interconnected firms that share activities and resources among themselves (Axelsson & Easton, 1992). These networks consist of customers, suppliers, distributors, media, universities, public organizations, expert organizations, investors, lead users, and regulators. Companies that participates in innovation networks have different motives for engagement or contrarily, for not taking part and interacting (Corsaro & Snehota, 2011). These motives are related to the business goals of the companies and it concerns the company's reasons to interact with other firms in the innovation process (Öberg & Shih, 2014). They state that, the interests, priorities and interaction goals of the participating companies of a network are of importance, regarding development and commercialization activities. They define the terms as following in Table 7 below:



**Table 7.** *Definitions of priorities, interests, and interaction goals.*

<b>Term</b>	<b>Definition (Öberg &amp; Shih, 2014)</b>
Priorities	How parties choose between alternatives, and in this context, refer to their orientation toward incremental or radical innovations.
Interests	Shows intention toward the innovation and identifies whether the parties are open to new ideas.
Interaction Goals	How and why companies choose to interact with other parties in the innovation process.

According to Öberg & Shih (2014), similar or different priorities, interests, and interactional goals (logic) of the companies in a network affect the development of the innovation and commercialization processes. They emphasize the convergent logic of companies in a network for the success of a novel innovation. It is proposed that for the innovation to be successfully developed, network parties would need to be part of the same shared logic nets (SLN), with the aim to overcome the possible conflicts in priorities of companies. SLN in a business network considers the connected companies with the same convergent logic, rather than the interactions itself. Consequently, companies in a SLN that have convergent logic do not necessarily interact with each other, but their logic may impact a party (Pick, 1999). For example, policy makers have an impact on the other parties regardless of the interaction. Shared logic nets as part of a network is illustrated by Öberg & Shih (2014) in Figure 4 below.



**Figure 4.** Shared logic nets in a network (Öberg & Shih, 2014).

In the Figure 4, dotted lines that create an ellipse represent a shared logic net among companies, while straight lines represent the direct interaction between parties. Here, it can be seen that although two companies are in the same shared logic net, they do not interact with each other. As an example, this interconnection can be between a policy maker and a developer or manufacturer. In these shared logic nets, parties with the convergent logic that has same priorities, interests, and interaction goals are clustered and the ones with divergent logic is separated. A company in a network that has a divergent logic than others might need to reevaluate its priorities and goals for the success of the innovation. These goals and priorities should be in line with the members of the network or some reasons and leads should be introduced to other network members to address their goals and priorities (Öberg & Shih, 2014).

In order to emphasize how networks affect the innovation diffusion depending on the innovation type, Chiesa & Frattini (2011) state that market failure of a radical innovation is affected by the negative post purchase attitude of early adopters, while a systemic innovation is affected by lack of support from the adoption network. This result is explained by the strong relation between the adoption network support and market performance regarding systemic innovations. Systemic innovations tend to fail if there is no support from the network actors, as it requires a much deeper change in the current system than it requires in radical innovations and needs support from the network. As for radical innovations, the market failure is more likely caused by the negative acceptance of early adopters. In systemic innovations, expected benefits are easier to foresee and one actor

can orchestrate the whole network, whereas in radical innovations goals, resources, and activities are unclear and develops over time (Aarikka-Stenroos et. al., 2017).

When the consumer's initial expectations of a product do not match with the perceived value they receive after the purchase of the product, satisfaction levels diminish (Churchill and Surprenant, 1982). With regard to the customer acceptance, according to Chakravorti (2004), interdependent players do not switch to a new product unless they see that other players are also convinced to shift to use these products, which makes customer acceptance even more difficult. Combining with the consumer's personal assessment of product's capability to meet their demands, the attitude of network players towards the new product has a significant effect on product's market success. The players in that network that might shape the decision of a switch to the new product might be the companies that supply products or services complementary to the innovation, and companies involved in distributing the innovation or information (Chiesa & Frattini, 2011). The authors give product examples of Sony MiniDisc and 3DO Interactive to explain the market failure of these products due to the lack of search for support from their adoption network. According to them, innovator companies should not expect that product diffusion would naturally attract network players to support innovations, and the historical data on this matter backs up this statement (Chiesa & Frattini, 2011). They point out that initiating long-term partnerships earlier and sharing activities, costs and risks with network partners has proven to be an effective way of promoting products in markets.

Another example for the importance of obtaining support from the network actors in the early phases of the development for the innovation is from Katz and Shapiro (1986, 1992), who bring out the "chicken and egg" problem, in which the innovator firm, customers and investors enter in a cycle, where all parties in a way anticipate the first move of action from the other side. In this dilemma, customers do not purchase the products if they don't see the complementary products or if the product availability is not widespread. Usually, this issue concerns the customers that fits into the category of late adopters, as they are more interested to see the product value by evaluating the support from its adoption network once the product is diffused successfully (Rogers, 2003). On the other side of the problem, companies that would help the diffusion are not willing to invest unless they see a solid installed base, which all leads to a cycle that must be broken for the good of innovator firm. This problem can be also explained by an example of a printer company, when the company wants to launch new ink cartridges for the printers. To sell high numbers of cartridges, many printers should be sold in the first place. However, customers would want to see the complementary products for the printers before they make the decision of buying. This problem is illustrated in Figure 5 below:

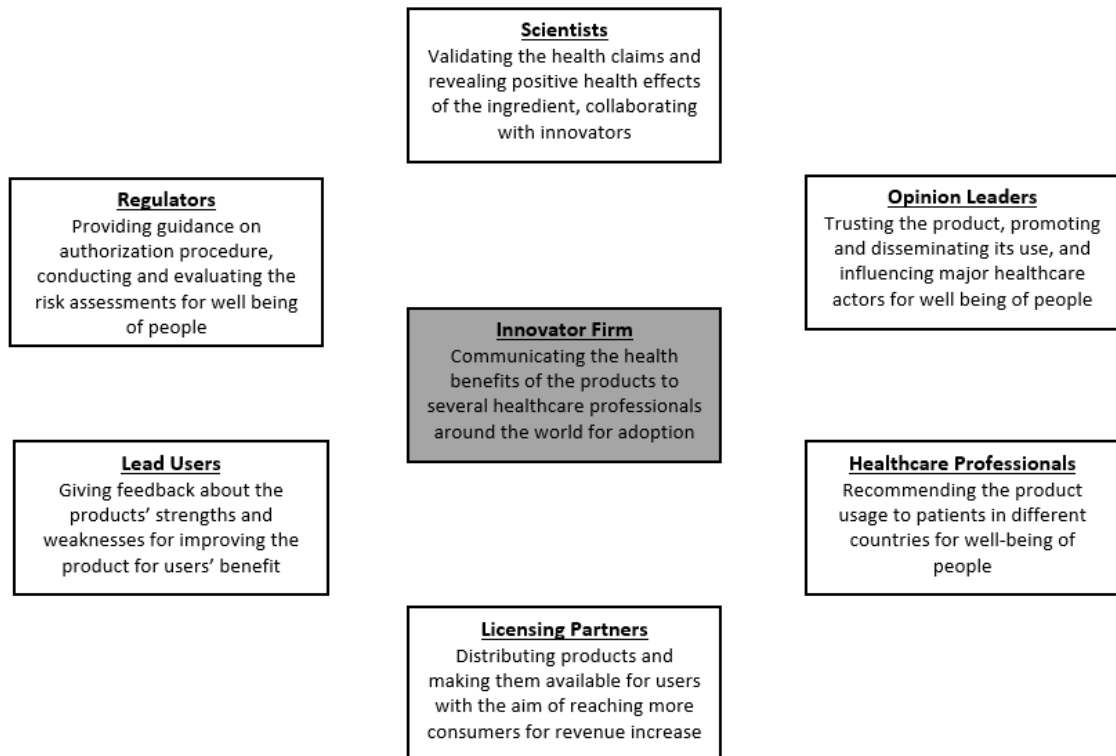


*Figure 5. Chicken-egg cycle in business settings.*

This theory emphasizes the importance of obtaining support from the network actors in the early phases of the development for the innovation to gain reputation and credibility in customer and network settings. In order to receive support from the adoption network for a systemic innovation, a company should put effort on improving its inter-firm relationships. Involving other related network players in the new product development processes would enable the innovator company's products to diffuse in the market, as these players would support the innovation and use their resources on producing and commercializing products incorporating the innovation's current technology (Chiesa & Frattini, 2011).

## 2.7 Stakeholders That Influence the Diffusion of Innovations

Following the literature reviews on commercialization and stakeholders, a framework is depicted below in Figure 6 to present an overview and provide broad understanding on how different type of stakeholders play roles on diffusion of innovations and help the focal firm in the ecosystem to gain a competitive position. The activities that stakeholders perform is not only for their own benefit, but they also contribute to the value creation in the ecosystem. These activities are explained along with their motivations:



**Figure 6.** Stakeholders around the innovator firm that influence diffusion of innovations.

In the next chapters, research methodology and results of the research will be presented. The above framework will work as a basis for the results part as empirical analysis, when exploring the activities and motives of stakeholders, as well as the interactions between them. Stakeholder activities and motives will be examined in more detail, enabled by conducted interviews with several actors. The interviews will be conducted with regulators, a research organization, an opinion leader, a marketing manager of the focal firm, licensing partners, and a scientist who had crucial roles on dissemination of the innovation in several countries.

### 3. RESEARCH METHODOLOGY

#### 3.1 Research Design

This thesis studies how different actors around the innovator firm that comprises an adoption network in functional food industry influence the success/failure of commercialization of a product. Main research question of the thesis is:

- *RQ: How do different stakeholders influence the success of commercialization of an innovation?*

The main research question is divided into four sub-questions as following:

- *Who are the relevant stakeholders that can contribute to commercialization?*
- *What kind of activities do stakeholders employ for effective commercialization?*
- *What are the motives of stakeholders to be involved in along commercialization?*
- *How stakeholders and their activities are interconnected?*

Exploratory research is conducted to gain background information, to define terms, to clarify problems and hypotheses, and to establish research priorities. Methods of conducting exploratory research are secondary data analysis, experience surveys, case analysis, focus groups, and projective techniques (Burns and Bush, 2006). In exploratory research, researchers are open to new ideas and insights as they proceed. Creativity of the researcher plays a major role in this type of research (Malhotra and Birks, 2000). The nature of this thesis is explorative and the goal is to develop the existing theory of commercialization activities, diverse interests and motives of stakeholders by studying the activities that different stakeholders employ within an ecosystem in functional food industry. Case study method was used to approach the research questions and explore the phenomenon. Main research question requires the exploration of the commercialization phenomenon and the activities associated with it. Moreover, the need for comprehensive identification of the diverse stakeholders and their motives makes this research explorative in nature.

The research questions in this study are approached with qualitative analysis to explore the phenomenon. Qualitative analysis is chosen for this research, because this type of analysis leads to spontaneous findings from naturally occurring ordinary events in natural settings, and helps the researcher express the findings of the study in a more convincing and undeniable way. In contrast to the quantitative analysis, qualitative analysis is organized into incidents or stories that has a concrete context, which makes it more convincing to the reader than plain numbers of quantitative analysis (Miles & Huberman, 1994). Furthermore, the nature of the questions in this research required the analysis to be a qualitative one, which seems to be the most appropriate.

Qualitative research analyzes data from direct fieldwork observations, in-depth, open-ended interviews, and written documents (Patton, 2005). According to Miles & Huberman (1994), qualitative data is usually in the form of words rather than numbers. They state that qualitative data is the source of well grounded, rich descriptions of processes, and it helps researchers to see the chronological flow of events, to see which events led to which consequences, and generate useful theories. Researchers conducting qualitative analysis study real-world settings to construct case studies and generate narrative descriptions, which is called naturalistic inquiry and it is the foundation of qualitative research. Inductive analysis takes place in qualitative research. According to Patton (2005), qualitative investigations starts with narrative descriptions of notions, then case studies of the phenomenon are constructed, and then finally comparisons and interpretive search for patterns are made. He states that researchers are able to make firsthand observations of activities and interactions, and in some cases they can personally engage in those activities as participant observer. Researchers can talk with people about their experiences and perceptions, as well as they can conduct formal individual or group interviews. Documents and records are examined throughout the process. After collecting the notes in the field, researchers can turn this raw data into a more systematic, narrative descriptions that are extracted inductively. The purpose of such studies is to gather information and generate findings that are useful.

Flick (2009) explains that in qualitative research, the use of the existing literature is increasingly relevant, and there are several points in the research process where the use of the literature can prove helpful or even necessary. He states that in planning research, in analyzing materials, and in writing about findings, making use of the existing literature about other research, theories, and the methods is essential. In this thesis, to build up the literature review, studies from several authors were benefited, whose work are mainly about commercialization and stakeholders. The purpose of the literature review was to map the relevant actors that take part in commercialization activities of an innovation that affect the processes, as well as explaining the broad concept of multi-actor approach in commercialization, to give clearer view on the empirical part of the research.

Case studies are preferred when the researcher has little control over the events and when the focus is on real life phenomenon within real life context. Generally, case study method is used when “how” and “why” questions are being asked (Yin, 1994). Case studies can be used to accomplish various goals such as providing description, testing theory or generating theory (Eisenhardt, 1989). In case studies as a research method, the case that is being studied should be defined, the relevant data to be collected should be determined, and what could be done with the data once collected should be planned (Yin, 2003). Case studies consist of qualitative data, quantitative data, or both (Yin, 1984). Schramm (1971) states that the essence of a case study is that it illuminates a decision on why it was taken, how it is implemented, and what is the result. Contextual conditions are covered that is

relevant to the phenomenon. Case studies rely on multiple sources of evidence and benefits from prior development of theoretical propositions (Yin, 2003). Stoecker (1991) points out that case study consists of the logic of the design, data collection, and data analysis all together comprehensively, and it is not only a research design or data collection feature alone. There are at least five different applications in evaluation research (Patton, 1990):

- Explaining the presumed causal links in real life interventions that are too complex for experimental strategies.
- Describing an intervention and the real life context in which it occurred.
- Illustrating certain topics within an evaluation in descriptive mode.
- Exploring situations in which the intervention being evaluated has no clear outcomes.
- Meta evaluation (A study of an evaluation study)

The development of case study designs need to maximize four conditions related to design quality, which are construct validity, internal validity, external validity, and reliability (Yin, 2003). According to Patton (1990), in qualitative research, in depth analysis can be conducted on small samples. Therefore, qualitative methods are suitable for this research, as the sampling is not great in size and the case company is selected purposefully. Patton (1990) states that what constitutes a case or unit of analysis, is determined in design stage and becomes the basis for purposeful sampling in qualitative research. In a single program case, one may do case studies of several participants, and then cross-case pattern analysis of the individual cases might be part of the data. Case studies facilitate a holistic understanding of complex phenomena that are not easily separable from their context (Easton, 1995; Eisenhardt, 1989; Halinen&Törnroos, 2005; Yin, 2009). Since the involvement of many stakeholders is needed in the commercialization of a product of a functional food industry due to its relatively sensitive health context, case study method is a good way to show various points of view of each stakeholder, their impacts, and how they influence the whole process. In this thesis, empirical observations from the case study and the existing literature are combined to extend the knowledge on commercialization and stakeholders.

A single case study of an organization in functional food industry is conducted in this thesis. According to Yin (1994), single case can contribute to knowledge and theory-building. Such a study can even help to refocus future investigations in an entire field. The reason for selecting a single case rather than a multiple case study is that the investigator has access to a situation that is previously inaccessible to scientific observation. Moreover, a multiple-case study might require extensive resources and time. The single case study is thus worth conducting because the descriptive information alone will be revelatory (Yin, 1994). In our study, we are conducting interviews with several stakeholders to find out their activities and motives for performing those activities, which is not discovered in previous studies, thus a single case study approach suits best in our



research. Our study reveals the interactions between organizations and individuals, focusing on one focal company in the center of other organizations as an orchestrator.

### 3.2 Data Gathering

According to Gummesson (1993), the general reason for doing case study research is to better understand complex phenomena. He states that in case study research, qualitative methods are often used for data generation, which may have given rise to the notion that case studies are mostly qualitative. Case studies may also benefit from quantitative methods.

Qualitative data can be gathered using the following methods:

- Existing materials
- Questionnaire surveys
- Qualitative interviews
- Observation
- Action Science

There is not only one option to use these methods. Therefore, in practice a combination of the methods are used when gathering the data (Gummesson, 1993). First, in existing material data gathering method, books, photos, web pages and statistics can be used. The advantage of this method would be saving time, as someone already has made the data input. Second, questionnaire surveys lead to better qualitative interviews. By the application of these surveys, interviews are being more standardized and formalized. Questionnaires can give answers to the questions such as how much, how many and how often. They are mostly useful for clearly defined problems. Third, interviews are the most common method of qualitative data gathering. The topics that will be covered should be studied well before the interview is conducted. Although there are similarities with questionnaires such as interaction of people, interviews take place in a more informal way than questionnaires. Interviews yield direct quotations from people about their experiences, opinions, feelings, and knowledge (Patton, 2005). Fourth, in observation method, the data can be gathered using all the five senses of the researcher. This method is used to gather data which is not available by expressing in words. The advantage of this would be accessing information that is not provided in anywhere else. It consists of detailed descriptions of people's activities, behaviors, actions, interactions, and organizational processes (Patton, 2005). Fifth, in action science, in other words in action research, other methods of data access must be examined, which are interviews and observation. Active participation is needed. Usable knowledge that can be later applied and validated in action should be produced. In this thesis, the use of existing materials and qualitative interviews are employed as the main method of data gathering.

Interviews and focus groups are the most common methods of data collection used in qualitative research (Gill et. al., 2008). According to Patton (1990), the purpose of interviewing is to allow the researcher to enter into the other person's perspective, and the quality of the information obtained depends on the interviewer. There are three fundamental types of research interviews: structured, semi-structured and unstructured. In this thesis, semi-structured interviews are used, which consist of several key questions that help to define the areas to be explored, but also allows the interviewer or interviewee to diverge in order to pursue an idea or response in more detail (Gill et. al., 2008). Semi-structured interviews allow researchers to go with the flow while asking pre-determined questions to obtain the information. According to Flick (2009), in qualitative interviews, narratives can be used to elicit a more comprehensive and contextualized account of events and experiences, and this can be achieved with either overall life histories or situation-oriented narratives. He states that there are different ways of conceiving narratives in interviews: either as the main form, standing alone, or embedded in different forms of questions. Sometimes other forms of accessing experiences might be needed to complement, or even replace, narratives.

To increase the legitimacy of the case study, author used various data collection methods. As secondary data, existing literature on commercialization and stakeholders, scientific research on plant stanols that is published in various journals, innovator firm's website for comprehensive information on the relevant stakeholders, publicly accessible documents and books for determining the related actors and for understanding the overview of functional food industry and its products were used. In addition to the secondary data, semi-structured interviews with open-ended questions with internal and external stakeholders, and observations throughout the thesis were employed. In total, 7 qualitative interviews were conducted with regulatory bodies, doctors, scientists, a research organization, innovator firm, and licensing partners as the primary source of data generation in this research. Four of the interviews were conducted in interviewee's offices face-to-face, while 3 of the interviews were conducted on Skype due to the limited availability of the interviewees and the distance between the interviewer and interviewees. All the conversations were recorded with the interviewee's consent. Different interview questions were designed depending on the actor type. As an overview, the questions are designed in accordance with the research questions of the thesis, with the aim of learning about the informant's activities and their motives on performing those activities. The questions were later improved after reviewing them with the thesis supervisor. Before the interviews, the activities of the organization of the interviewees and the projects they are currently or previously involved were thoroughly examined to know more about the informants. All the interviews were conducted in 4 month time period and about 5 hours 30 minutes of interview recordings were transcribed for analysis. The dates and lengths of the interviews are listed in Table 8 below.

**Table 8.** *Details about interviews.*

<b>Interviewee</b>	<b>Role</b>	<b>Date</b>	<b>Duration</b>
Leena Mannonen, Anne Haikonen (MMM)	Commercial and Legislative Counsellors (Food Division, Food Safety Unit)	26.04.2018	52 mins
Nesli Sözer (VTT)	Principal Investigator (Plant based proteins)	27.04.2018	20 mins
Pekka Puska	Former Director General of THL	21.05.2018	45 mins
Susanna Rosin (Raisio)	Science and Nutrition Communication Manager	11.06.2018	52 mins
George Crocker (Olivio USA)	General Manager	13.06.2018	45 mins
Donny Bambang Iryanto (Kalbe Nutritional Indone-sia)	Business Unit Head	25.07.2018	35 mins
Helena Gylling	Contributor to the research of plant stanols	04.07.2018	87 mins

The interviewees were selected based on their experience and their high degrees of contribution to Benecol's commercialization process over 20 years, except the research organization. The informant from VTT in this research acted as a general information provider who is involved in the improvement of plant based foods, which is in the similar ingredient category as the Benecol's main ingredient, plant sterol ester. The selected interviewees were the major stakeholders that influenced large masses in terms of the ingredient's scientific validity and health claims, and helped Benecol for its dissemination in Finland and abroad. The informants were sampled and chosen after the inventor of Benecol provided the names of relevant actors who were involved in its commercialization. After receiving the names of the relevant actors, author ran an extensive web search to access their contact details. Following this process, the informants were contacted and the interview dates were set. In order to reach licensing partners in other countries, Olavi

Erkinjuntti's help was needed, who is the director of rest of the world business in Raisio. The list of interviewees is shown in Table 9 below. This data is gathered through the websites of the mentioned organizations in the list and the role of the individuals is obtained through their corresponding organization page.

**Table 9.** *List of interviewees.*

<b>Actor Type</b>	<b>Organization</b>	<b>Name</b>	<b>Role</b>
Regulator	Finnish Ministry of Agriculture and Forestry	Leena Mannonen	Commercial Counsellor (Food Division, Food Safety Unit)
Regulator	Finnish Ministry of Agriculture and Forestry	Anne Haikonen	Legislative Counselor (Food Division, Food Safety Unit)
Research Organization	VTT	Nesli Sözer	Principal Investigator (Plant based proteins)
Opinion Leader	National Institute for Health and Welfare (THL) of Finland	Pekka Puska	Former Director General of THL
Innovator	Raisio	Susanna Rosin	Science and Nutrition Communication Manager
Licensing Partner	Olivio USA	George Crocker	General Manager
Licensing Partner	Kalbe Nutritionals Indonesia	Donny Bambang Iryanto	Business Unit Head
Scientist	Biomedicum	Helena Gylling	Contributor to the research of plant stanols

Flick (2009) argues that in an interview, interviewees should be given as much scope as possible to reveal their views. At the same time, they should be given a structure for what to talk about. Careful consideration should be given to the wording of each question before the interview (Patton 1990). In a qualitative interview, good questions should be open

ended, require more than a yes/no answer, neutral, and understandable. It would make sense to start with easy questions to let interviewee build up confidence and then further proceed to more sensitive questions. A very important step is planning for probing interviewees. Before the interview, respondents should be informed about the study details and confidentiality of the interview (Britten, 1999). Questions should be reformed, if the interviewees' answers remain too general or if they miss the intended point. There are some key points for evaluating interview questions (Flick, 2009):

- Why this specific question is asked?
- What is its theoretical relevance?
- What is the link to the research question?
- Is the question easy to understand?
- Is the question unambiguous?
- What is the relation between single questions?

### **3.3 Data Analysis**

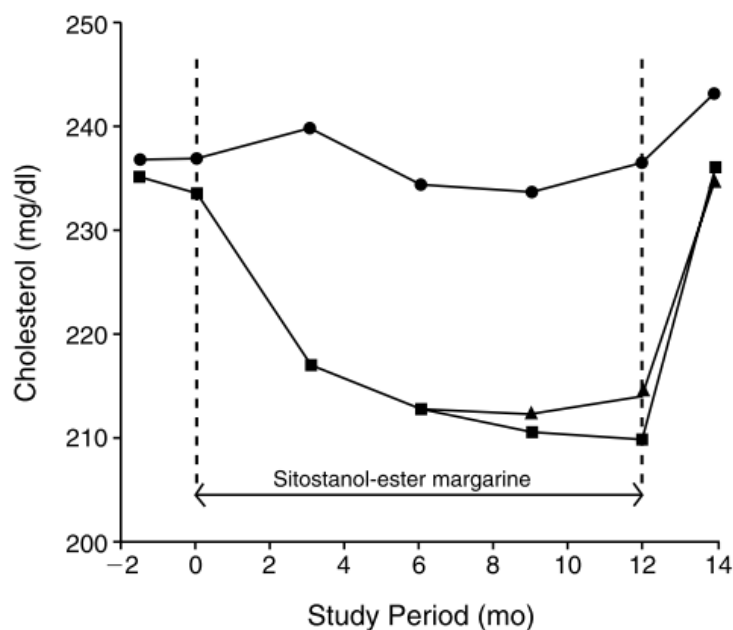
The interview transcriptions acted as a base for analysis for the results part of the thesis on the activities and motives of the stakeholders. The results from the interviews were analyzed by making comparisons of each stakeholder group and mapping the connection and relationship between them that affected the course of events throughout the commercialization process. Apart from the interviews as primary data source, books, journal articles and company's website were used to gather required information and to analyze the informants' statements. As the data of the study is qualitative, the frameworks created in this thesis are based on the interpretations of the author, following the gathered information from the interviewees and from the secondary data that explains the functional food ecosystem and the key players that influence the interactions.

### **3.4 Case Company**

The case company of the thesis is Finnish food manufacturer Raisio that manufactures the cholesterol lowering margarine Benecol, which is sold in 30 countries worldwide. It has 120 different product variations, which are spreads, yogurts, mini drinks, cereal (grain) products, cheese, coffee, instant drink powder, milk drink, and food supplements. Products are tailored for the local market needs of the countries they are sold in, and manufactured by the well-established local companies, containing the essential ingredient plant stanol ester in each product. Benecol proved its success in international markets short after the discovery of its main ingredient, plant stanol ester, in 1989 in Finland. Plant stanol ester was created by Dr. Ingmar Wester from Raisio, and the first Benecol product that contains the ingredient was launched in 1995.

We selected this extreme case, a radical innovation, which is a functional food and a novel product category between food and medicine that needs support from diverse stakeholders at global market settings for its effective commercialization. This case presents a good base for investigating the activities of diverse stakeholders due to several reasons. First, as Benecol is a vegetable fat spread that lowers cholesterol with its unique ingredient plant stanol ester and categorized as a functional food, its market launch had difficulties in some countries regarding regulations as the health is concerned. Therefore, multitude of stakeholders were involved in its commercialization process over the years. Second, plant stanol/sterols were among 10 greatest innovations in nutrition research between 1976 and 2006, and lots of medical studies and experiments were conducted by primary healthcare actors to test the viability and the positive health effects of the ingredient. Lastly, Benecol was one of the first functional food product that is considered as a disruptive innovation, which created a new market category, and attracted many people from around the world. It attracted various licensing partners in different countries, hence interactions between these actors in international settings provide a good base for the investigation of their activities.

Plant stanol ester's cholesterol-lowering effect has been proven in over 70 clinical studies. It lowers blood LDL cholesterol by blocking the absorption of cholesterol in the small intestine. The first study that showed the 12 month sustained effect was published in *The New England Journal of Medicine* (Miettinen et. al., 1995). According to this study, a daily intake of 1.5-3 grams of plant stanols reduces serum total and LDL cholesterol levels dose-dependently by an average of 10%. Apparent effects can be seen after 2-3 weeks of daily consumption and it is sustainable as it is consumed daily. The reduction of 10% in LDL cholesterol levels is made possible by the daily intake of 2 grams of plant stanols, as it reduces cholesterol absorption by approximately 40–50% (Gylling et. al., 1997). The effects of the 12 month consumption of plant stanols can be seen in Figure 7 below (Miettinen et. al., 1995).

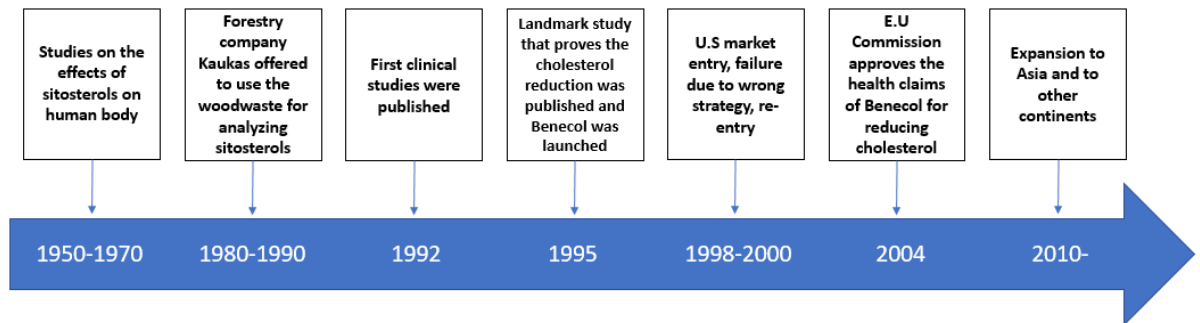


**Figure 7.** Serum cholesterol levels before and after the consumption of margarine with and without sitostanol ester for 12 months (Miettinen et. al., 1995).

In the figure above, the line with the circles represents the control group that consumed the margarine without the plant stanols. The line with rectangles represents the group that consumed 2.6 g of sitostanol per day and the other line with triangles represents the group that consumed 1.8 g of sitostanol per day. The study proved that continuous consumption of plant stanols has an effect on cholesterol reduction.

After Raisio's substantial success in Finland, the company started licensing out the ingredient for international expansion in United States (US), and faced various challenges regarding the regulation, policies, and creating awareness among consumers in 1999. Raisio's licensing partner in US, McNeil Consumer Nutritionals, had decided to market Benecol in the US as a dietary supplement to take advantage of the dietary supplement regulations which allows stronger health claims on packaging for these type of products. However, Food and Drug Administration (FDA) of US did not agree with McNeil that Benecol was a dietary supplement, and stated that it is subject to US food regulation. This strategy in US caused a delay of 6 months in Benecol's launch and even after the launch, it could not attract customers and sales were under the anticipated levels. The price of Benecol was much higher than its competitor Flora. Although the health claims were different for these 2 products, Flora had a more appealing packaging with a heart-shaped logo and more attractive sales price than Benecol. On consumers mind, the effect of Benecol was not well understood to justify the price premium of 4-5 times of the regular products (Mellentin & Heasman, 2001). After the disappointing experience in internationalization in US, in the beginning of 2000, Raisio announced that it would take over responsibility for Benecol's marketing in the Baltic region (Sweden, Norway, Denmark, Poland, Russia and Iceland) along with the Finnish market.

After EFSA's (European Food Safety Authority) approval on the health claims in 2004 for plant stanol ester that it reduces cholesterol and thus reduces the risk of coronary heart disease, Benecol has been expanding in Asia and Europe with new licensing partners. The timeline of important events throughout Benecol history is illustrated in Figure 8 below.

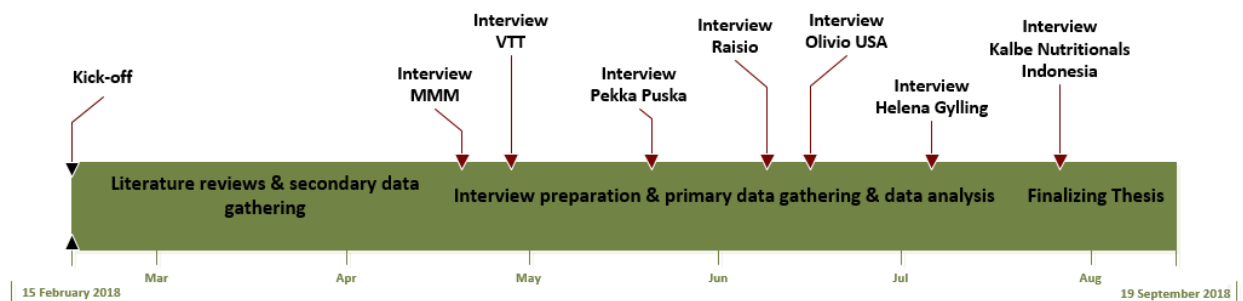


*Figure 8. Milestones in Benecol timeline.*

In early 2018, Raisio management restructured the whole company and reorganised operations. The main change was the integration of all Raisio's food brands and businesses into the Healthy Food Division. This means the discontinuation of the Healthy Food Units which included Benecol Unit. There used to be a separate division for Benecol and there have been different types of structuring throughout the years but now there is only one division with all the products. This include not only Benecol products but also other grain based products and everything is under the same division.

### 3.5 Research Process

The thesis work was completed in 7 months. The research process was divided into three main phases, which includes literature reviews and secondary data gathering, interview preparation, primary data gathering and data analysis, and finalizing thesis. The timeline is illustrated in Figure 9 below.



*Figure 9. Timeline of the research process.*



The thesis work was officially kicked off on 15 February 2018. In the first two months, the focus was on theoretical research and gathering the secondary data. In this stage, more information about the case company and about its innovation were gathered to get familiar with its processes. After two months of theoretical research and literature reviews, interview questions were prepared and interviewees were contacted. The interviewing process took four months and seven interviews were conducted during this period. Qualitative data that was gathered from interviews acted as a foundation for the results part. Final editing was made in the last stage of the research and the thesis was finalized on 19 September 2018.

### **3.6 Evaluation of the Research**

The scientific generalization from a single case might not be relevant as the scientific facts are rarely based on single experiments; they are usually based on a multiple set of experiments, which have replicated the same phenomenon under different conditions (Yin, 1994). There might be some bias in the interviewees' comments since they might have wanted to keep some of the sensitive information to themselves in order to protect their companies from possible interrogations. Furthermore, especially when explaining their motives, interviewees might have not shared the true reasons behind their activities for the focal company, due to the fear of being wrongly judged by people. Also, in order to not to jeopardize their relationship with the innovator firm, the informants might have not revealed their true opinions and they might have only expressed their positive interpretations. We acknowledge that such limitations might exist in the research and it is difficult to sense if the opinions of the key participants of this study reflect their own true views.

## 4. RESULTS

The results of the study is structured according to the research questions that are presented in sub-chapter 1.2. In this results section, the sub-chapters represent the relevant stakeholders that has a role in the commercialization process of Benecol throughout the years. In each sub-chapter, their activities, their motivation behind those activities, the projects they were involved, and the scope of the organization they represent are explained in detail. The stakeholders that have a direct influence on Benecol are: Ministry of Agriculture and Forestry of Finland by regulating the marketing of a food product in Finland and the associated legislative work as well as providing guidance to the companies on the authorization procedure; Evira by evaluating the novelty of the product and associated risks on country level; EFSA by evaluating safety assessments and the validity of the health claims as well as giving advice on risk management decisions that are made by European Commission; opinion leaders by trusting the product, promoting and disseminating its use for well-being of people and influencing the major healthcare actors; marketing and nutrition communication managers by communicating the health benefits of the product to several healthcare professionals around the world for adoption; licensing partners by distributing products in overseas and making them available for users; and scientists by validating the health claims and revealing positive health effects of the products.

### 4.1 Regulatory Environment

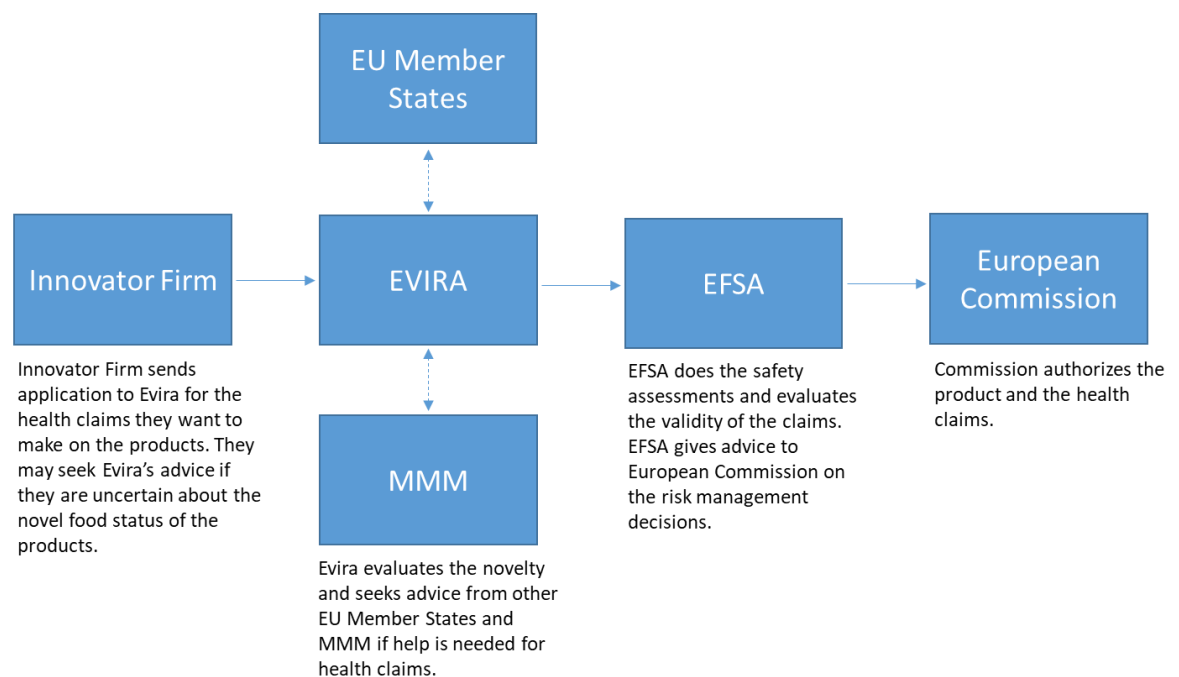
An interview was conducted with legislative and commercial counsellors in Ministry of Agriculture and Forestry (MMM) in Finland and according to the information provided, the regulatory environment in novel food industry consists of Evira, MMM, EU Member States, and EU Commission. In this context, the areas of expertise and the scope of work of the related organizations is listed in Table 10 below.

*Table 10. Focus areas of organizations.*

Organization	Scope
MMM (Ministry of Agriculture and Forestry of Finland)	MMM is responsible for the legislative work on food products as part of the Finnish Government and it is working with EU institutions for decision-making.
Evira (Finnish Food Safety Authority)	It is a centralized body operating under the Ministry of Agriculture and Forestry in Finland. It conducts risk assessments and scientific research.

EFSA (European Food Safety Authority)	The European Food Safety Authority is the agency of the European Union that provides independent scientific advice and communicates on existing and emerging risks associated with the food chain.
European Commission	The European Commission is an institution of the European Union, responsible for proposing legislation, implementing decisions, upholding the EU treaties and managing the day-to-day business of the EU.

Among these organizations, Evira and MMM represent the main bodies in Finland in terms of novel food regulation, and EFSA and European commission are higher level regulatory authorities. In this regulatory chain, although the last decision is made by European Commission, EFSA has the highest authority and has the most influence on a marketed product regarding safety assessments and the validity of the health claims. The authorization procedure of a novel food in Finland is illustrated in Figure 10 below.



**Figure 10.** Authorization procedure for novel foods in Finland.

The authorization process of a novel food in Finland starts with the innovator firm's application to Evira for the assessment of the novelty of the product. Anne Haikonen, legislative counsellor from MMM explains the process as follows:

*“For health claims, there is harmonized authorization system based on EU (European Union) legislation. Evira is the contact point if a company innovates a new product and they want to tell about health benefits. They contact Evira to confirm*

*if the claim they want to make is considered as a health claim and then they make an application. Evira sends it to EFSA (European Food and Safety Authority). Then EFSA is responsible for the scientific assessment and the decision will be made on the EU level commission regulation. Only health claims authorized within this system can be used."*

In Benecol's case, as they came to the market prior to the novel food regulation in EU that took place in 1997 for safety assessments, Benecol had the chance to skip the authorization procedure for their products. Proper use of the food was company's and consumers' responsibility. Leena Mannonen, commercial counsellor from MMM, explains the situation:

*"For Benecol case, the process was a bit different. Benecol entered the market before 1997 and it is enough to call it old food with regards to novelty. So there was no authorization for Benecol products apart from the claims. There were some labelling criteria set for all similar phyto sterol/stanol products, and Benecol applied to those as well. But for the authorization process, there was none for Benecol for proving safety. For health claims, the authorization were needed. The company was responsible for the safety issues before 1997. Although we evaluated beforehand, proper use of the food was company's responsibility. For novelties, we decided to have this regulation for pre-authorization assessment. The health claims regulation took into effect in 2007. First safety came (1997), and then regulating."*

Leena Mannonen also points out that with the new regulation for novel foods in European Union that came into effect in 1 January 2018, a centralized system started to be used for the health claims. She talks about the new regulation:

*"We have a new regulation (EU) 2015/2283 on novel foods and it is applicable started from this January. It is a centralized system in Europe. Before, it was decentralized and only for one company who requested authorization. But now approvals are generic so anybody, if you find your product (ingredient) in the list within the specifications, you can bring your product into the market. When the claim has been authorized, anyone whose product fulfills the criteria can use those claims. Before January 2018, it was up to the member states to evaluate the safety and to authorize the products. Now, these systems can be parallel and they are hoped to a certain extent to be parallel if there is a possibility that company wants to claim exclusivity for the food and the claim for 5 years. Then especially we try or EFSA and the commission try to make systems go parallel. So the 5 year period would be same for both but we have never tried that yet so we don't know if it works. Validity lasts for 5 years for the health claim if it fits into the criteria."*

The new regulation introduces convenience to many larger-scale companies who can fit their products into the criteria. They are more willing to go through the authorization processes, compared to the smaller scale firms. According to Mannonen, larger scale firms tend to claim the safety of their innovations to attract more customers. However, it might be challenging for small enterprises, as the research and development takes up resources. Some companies might not be eager to go through the assessment process. Some try to avoid, and some try to go through this authorization. Leena Mannonen talks about the future of the new regulation and how they are working on specifications to make it easier for new entrants:

*“It is early to say how things will proceed. Now we have just prepared the initial list of authorized novel foods. Tricky part is to draft the specifications. Only if the product fits into the specifications, you can benefit from the authorization. Specifications is not perfect yet because they are based on the old authorizations. And they were prepared for one particular company, which makes it not helpful for anybody else. But in the long run, we will try to draft the specifications in a way that it would be easily fit for other companies’ products as well. Proof of safety is crucial because we need to have some sort of control what we have assessed as safe and what we can authorize. It will be forming somehow in the coming few years. It is helpful for all companies but also it might be hard to fit your product within specifications.”*

The interest in functional foods has been decreasing since early 2000 due to the strict regulations of the authorities. Leena Mannonen points out:

*“Ever since we got the regulation, which was fairly strict for functionality, EFSA is quite strict in assessing the functionality and proof of functionality. I think that is why interest is decreasing because criteria were too high. We didn’t or anybody didn’t anticipate the high standards EFSA has set. Before 1997, the regulations were on national level for anything that was authorized. In Finland, we had a voluntary system for a couple of years. A group of professors were used for evaluation of functionality and it was on voluntary basis. Proving the functionality was too difficult because EFSA’s criteria was too high. If you prove and go through EFSA’s authorization, you have European wide markets.”*

These strict policies applied by regulators limited the potential for goals-driven participation by innovator firms and decreased their willingness to invest in research and development due to the regulatory uncertainty of whether the regulators would approve the products or not. Because the statistical methods that were used by innovator firms were the first ones of its kind, the regulators were not familiar with them and they invalidated the research which caused the companies to stop using a health claim. Regulators require a link between a product and a positive health effect of that product, which means it is

causal-based model, and regulators consider that as a reference for category assessment and boundary drawing (Granqvist & Ritvala, 2016).

It seems that the new regulatory environment of novel foods, which is changed in the beginning of 2018 with the introduction of the new legislation (EU) 2015/2283 in EU, will make the authorization and commercialization process of a novel food easier. The new centralized system allows companies to market their products with a specific ingredient in any EU country, once a company obtain the rights to use the health claims for that particular ingredient after the safety assessments conducted by EFSA. Then the ingredient goes into the database and the list of authorized novel foods as safe for any company to use the same ingredient in their products. The convenience the new legislation provides the companies is that once they find the ingredient they use in the product in the novel food list, and once it passes the safety assessments, they can directly start marketing the product in any country in EU they wish to sell it. This new system might increase the competition between the companies, but it is anticipated that the distribution of the products for sales among different EU members will be easier. Moreover, since the policies seem to be less strict than it used to be, it might contribute to the innovation and research/development activities of food companies and encourage them to take initiatives to be more active in the industry.

## 4.2 Scientists

In order to get a scientist perspective on the commercialization of Benecol products throughout the years, an interview was conducted with Helena Gylling, who is notably one of the most influential persons that contributed to the scientific research and validity of the health claims of plant stanols, which is the main ingredient of Benecol product. Gylling's work on plant stanols and experiments she conducted with different doses of daily consumption uncovered the health benefits of plant stanols, which placed Benecol on top of its market and attracted many audiences from all over the world. She was also involved in many cardiovascular seminars and conferences around the world and explained positive health effects of plant stanols to many healthcare professionals, which promoted the dissemination of the innovation in plenty of markets, as she is a recognized scientist and has a high reputation in the field of plant stanols. She explains how she was involved in plant stanol studies as well as her contribution to Benecol:

*“Professor Miettinen was the chief of the department of internal medicine at the university hospital. When I went to do my residency in internal medicine, I also joined his research team. Then, I specialized in internal medicine and became a senior lecturer and worked in the hospital. Then I went to United States for a couple of years to do research there with cholesterol metabolism. Tatu Miettinen has started the Benecol research and when I came back, I automatically jumped in to these studies.”*

For stanol to take its form to be added in the margarine, they need to be converted from sterols with a chemical reaction, which is the basic form of stanols. She further explains how their research all started with plant sterols and the discovery of the ingredient:

*“I came from United States in 1990 and I joined Tatu Miettinen's research group and participated to Benecol studies starting from 1990. Tatu Miettinen was mainly working on cholesterol metabolism. He was doing very extensive studies on how cholesterol is absorbed, how it is synthesized, how it is circulating in the body, also in several diseases like atherosclerosis in which the arteries are calcified and cholesterol is the main reason of this calcification which causes heart attacks. In 1980's, a forest industry company, Kaukas' manager contacted Tatu Miettinen and offered him to make use of the wood waste that is left after processing. Sitosterols are generated in the trees and that is how the research group received sitosterol to analyze the substance and to convert it to sitostanol. When it succeeded, he contacted Ingmar Wester and Ingmar continued to esterify sitostanol.”*

Converting sitosterols into sitostanols is a costly process and even sterols could be used in the products without its conversion into stanols. However, the problem with sterols was that in the studies that were conducted between 1950 and 1970, when sitosterols are ingested, and when they are eaten in large amounts, due to its crystal line form the levels in the body increased a lot. Additionally, in animal studies the scientists were thinking that it caused also harm to coronary arteries and blocked them, which is a disease called atherosclerosis. The studies on the effects of sitosterols on human body took place between 1950 and 1970, and they were very well examined in that 20 year time. However, according to Gylling, at the moment scientists are a bit skeptical about whether these studies on sterols were accurate or not, since Unilever is using sterols in their products and proving that it has no negative effects on human body. Gylling's recent studies also support the sterols' safety. Even though Benecol was the first product of its kind that reduces cholesterol and it came to market before Unilever's Becel Proactiv, which also reduces cholesterol with its sterol ingredient and has the same positive health effects, Gylling explains the motivation and the reason behind the idea of sterols conversion into stanols to incorporate it in the first Benecol products:

*“Even though the consumption of sitostanols or sitosterols of 2 grams per day have the same cholesterol lowering effect by 10%, sterols are absorbed in intestine about 10%, while stanols are absorbed about 0,01%. Despite the fact that stanol absorption is 1000 times lower than the sterols, since the exact amount of the absorption in both situations is considerably low, they are both claimed to be safe to use. Tatu Miettinen had the chance to choose between sterols and stanols to incorporate in the margarine and he chose stanols due to its very slight effect. It doesn't harm the arteries at all, not even a tiniest bit. However, no one can say that eating 2 or 3 grams of sterols per day is harmful.”*

There are several advantages of using stanols over sterols: First, it reduces cholesterol, it is very little absorbed, its levels in our body are very low and it lowers plant sterols. In addition to these benefits, with 9 grams sitostanol consumption, we get 17% of cholesterol reduction instead of 10%, which is not the case in plant sterols. Although stanol offers higher reductions in cholesterol with higher amounts of consumptions, the use of it is not recommended by regulators due to the low number of studies conducted with higher doses. However, most of the doctors say that it would be good if the recommended amount was increased to 5-6 grams from 2-3 grams, because there are no side effects. The scientific contribution of Gylling's studies to Benecol is explained by her own words:

*"I was mainly in touch with the patients. I was doing the clinical work with the patients and what I did was separating the low density lipoprotein (LDL) particles and high density lipoprotein (HDL) particles from blood and I labelled them with iodine by that time. Then I injected them back to the patients and then we followed how they disappeared from their blood so we could construct how the sitostanol affected the metabolism of LDL and HDL particles. With European Atherosclerosis Society, we tried to investigate in the long-term, whether plant stanols or sterols are accumulating in the arterial wall and cause heart attacks or reduce the amount of new heart attacks. The studies showed that there are no negative effects of plant sterols and stanols. We have been using surrogate markers and measuring the functionality of the arteries with different type of equipment. Then we have been analyzing the plaques, which blocks the arteries. We were also analyzing the vascular effects of Benecol, and measuring how the arteries are functioning before and after the use. We saw that in some groups, in men, there was a slight improvement in small arteries. We measured how much blood enters to the very small area in a limited time."*

Gylling was also involved in many publications about plant stanol in which Benecol was mentioned. She describes her contribution to Benecol in the last 20 years by her publications, her speeches in various conferences, and also by promoting its health effects in several journals:

*"I joined the team 2 years after they started the research. My first Benecol study came out in 1994, one year before Benecol was launched, and since then, I have been involved in 60 articles. The landmark study came out on the same day Benecol was launched in Helsinki. I was in United States, in American Heart Association meeting and giving a talk about Benecol. Everybody was so interested. We have been writing about Benecol several times in our Finnish journals for medical personnel. Tatu and I wrote several papers in the Finnish journals when the Benecol was new and when the stock price of Benecol was the highest. There was huge amount of articles in our papers about this big business. I have been talking about Benecol in several congresses all over the world in the last 20 years."*



### 4.3 Research Organizations

Research organizations can support product development activities of innovator companies and take part as an additional resource with their knowledge and expertise. In order to examine the research environment in novel food industry in Finland and the activities a research organization perform, an interview was conducted with a principal scientist working in the field of plant based proteins in VTT Technical Research Centre. VTT Technical Research Centre of Finland is a leading research and technology organization in Europe and in Finland. Plant based proteins is one of the research areas in the organization in which they develop food products and ingredients with protein claims. According to the interview conducted, research organizations are highly involved in commercial projects with companies and they have influence on the processes. Nesli Sözer, a principal scientist at VTT, explains the different type of projects they deal with:

*“With companies we have different type of projects. The projects where the company is sole financer, and those projects are mostly kept confidential. They are down with the particular needs of the company as a research & development project. But we have also those projects which is jointly funded like co-creation projects which is kind of similar to what Business Finland is having at the moment. But our projects are without Business Finland. In those projects we develop a project idea based on mutual interest. And as a research company, we are not doing any production or any product launches in market. Sometimes we might have spinoffs but that is very rare in the food field.”*

She points out that, in VTT, they are taking part in the development processes in different ways, depending on the type of the company who applies to VTT for a food modification. She states that the companies that apply to VTT are either ingredient companies or food manufacturing companies. If it is a food ingredient company, the ingredient that the company wants to use in their products can be analyzed, developed, modified and adjusted for the needs of the company to meet the requirements of the health claim regulations or to meet the nutritional levels the company wants to achieve. She explains the processes:

*“We may be involved in either ingredient or product development. We might also help with the processes they have. Pretty much depends on the portfolio or the background of the company. So if it is an ingredient company, we take part in ingredient processing, ingredient modification and functionalization, and improving its applicability. But if it is a food manufacturing company, then we take part in the food matrix design. For instance, what we can do for a company is that when they come to us and ask to have high fiber claim in the bread (product), we do functionalization, recipe and process development for that company, so that they can have fiber claim in their bread. We know the required amount of the ingredient that needs to be present in the product per serving or per grams. Since VTT is quite multi-disciplinary research organization, we are also helping on team level which*

*is focusing on servitization so it also concerns how to communicate with the consumer. We also have different teams that focuses on the packaging. We have scientists who are experts on nutrition. And we also do interventions together with our collaborators from universities.”*

For the safety related analyses, it is possible for VTT to take part in measuring the toxicity levels in ingredients. However, Evira is the head organization if some trials are needed as they are responsible for safety assessments for food products in Finland. She gives an example from an emerging initiative, which is using wood ingredients for food applications:

*“We have initiatives like wood to food for utilizing wood components for food applications, meaning substances like lignin and nano-cellulose. Although cellulose has food applications, nano cellulose and lignin are not approved as a food material at the moment. Since we are not taking part in the commercialization path, we can only instruct companies who are interested in wood ingredients for food applications, as an example. They need to file the dossiers that will clear out the novel food legislation and so on. The tests and analysis of the safety of the ingredients are evaluated by Evira and also by other organizations. We can only provide some help and assistance.”*

Lastly, she explains the motives for performing her research and how the activities performed for other companies contribute to the goals and interests of VTT:

*“We are an organization running business based on research so that is our mainstream business. We also have government support and prioritize helping Finnish companies. In the end of the day, we are aiming to contribute to the Finnish economy and that’s our role within the society. Developing new technologies for well-being of people and creating new business ecosystems.”*

#### **4.4 Experts as Opinion Leaders**

The interview was conducted with Prof. Pekka Puska, who is the former Director General of the National Institute for Health and Welfare (THL) of Finland in 2009-2013, and former head of National Public Health Institute of Finland (KTL) in 2003-2009. Pekka Puska was also the director of North Karelia Project that was initiated in 1972, which was an initiative that succeeded to lower the male cardiovascular mortality by 68% in 25 years in North Karelia region and then in all Finland. In the project, in order to reduce the high mortality rates caused by cardiovascular disease, several different strategies were used. Innovative media and communication activities were performed. Systematic involvement of general practitioners and public health nurses was practiced. Collaboration with food industry, regulators, and national health authorities also played a vital role (Puska, 2002).

Puska also conducted studies on different risk factors of cardiovascular disease, such as saturated fat consumption, smoking, and alcohol consumption.

Due to his studies in cardiovascular diseases and his success in improving the healthy diet of a nation, Pekka Puska was later involved in commercialization activities of Benecol. He took part in some conference speeches and annual meetings of Benecol's licensing partners, explaining the positive health effects of the Benecol's main ingredient, plant stanol ester, which helps reducing the cholesterol levels. He points out how the change in people's eating habits starts with the change in products, and how the growing trend and mindset of healthy eating among people attracted some companies in the industry:

*“We spread a lot of all kind of health information but we realized that this was not enough. We need products to comply so that it will be easier for people. Not just to change them but change the products. So we started population surveys within this big project (North Karelia). In the beginning, when we contacted the dairy and meat factories to reduce the fat levels, nobody was interested. But gradually when our message became more and more popular, some companies started to think maybe there's some business possibilities. And so companies started first in North Karelia, then national level. They started to think about products that comply with the message and contacted us.”*

The importance of contacting all the relevant stakeholders and involving them to create awareness is once again emphasized here in North Karelia Project. In order to change the diet and eating habits of a population, various organizations should step up and cooperate for the same goal. However, the interests of these organizations must be in line with the goals of North Karelia Project. The aim of the project was to reduce the mortality rates caused by cardiovascular diseases, and the most significant organizations that would play a role in this goal were the food manufacturers and policy makers, as well as the consumers. In North Karelia case, the awareness was created by the media and Ministry of Health of Finland. Later on, the apparent demand from the consumer side triggered food manufacturers to act accordingly and this led to the reduced fat levels in food products. The illustration of the case can be seen in Figure 11 below.



**Figure 11.** Demand creation.

In the beginning, without any clear demand from consumers, food manufacturers were not eager to take actions to lower their fat content in their products. However, after consumers showed interest in North Karelia Project, manufacturers had to align their interests with the consumers and with the Ministry of Health. Pekka Puska explains more about the interaction between public and food producers and how he built a bridge between them to communicate their interests:

*“In the beginning of the project, we tried to convince people to change their diet. But very soon we realized that industry has much more influence and also policy makers, particularly in smoking. Then I started to contact food producers and also politicians. They were not interested at first. Then we influenced people. They started to influence companies and politicians more. Much of our influence to this was through people. And in our media strategy we used that a lot.”*

According to Pekka Puska, the major threat in people’s health and diet is the overconsumption of butter, high fat content of meat and dairy products, and high levels of salt consumption. He states that foods that are mainstream and consumed on a daily basis are affecting people’s health to a large extent. This kind of foods have more impact on well-being than functional foods. He explains how functional foods act as a role model for meat and dairy producers to lower their fat contents and provide healthier products:

*“My interest and background is in public health. And one big thing about functional foods is that as far as I see, they don’t change public health so much. The content of normal foods is more important and has much higher impact on public health. For example, people eat so much sausage. This HKScan sausage is fortified with rapeseed oil. Even small change in fat or salt is very much of importance. I think functional foods act as a spearhead and showing the way to other normal food producers. They get a lot of attention. Of course functional foods help a certain group of people like the ones who have high cholesterol so Benecol is good. But it is more important that they really showcase for public health.”*

As the healthy food innovations gained popularity in public and the consumption levels increased, other companies in the same field noticed that and tried to innovate new food

products or tried to change the content of their food products to fit the emerging trend of healthy eating. Pekka Puska played a role in communicating with various food producers to take actions on their food contents. He was aware that gradual reduction in salt or fat content of the products wouldn't cause a substantial difference in taste and wouldn't affect the sales of the companies. After food producers are convinced that consumers would still buy low fat products, the shift was either done by reducing the fat and salt levels in the products or by innovating novel solutions:

*“A dietary change is partly because people and products change. In Finland, in addition to these product innovations, we have dramatic change in normal food items. If you take sausage or meat products, the saturated fat level has gradually reduced. And salt is even better example. The salt content of Finnish food products have gradually reduced. There are specific innovations that we have been involved but there's no doubt that Benecol is kind of spearhead and real model. And after the commercial success of Benecol so many other companies followed the same trend. When fat is concerned, HKScan and Atria both have been doing innovations. I have been working particularly with the HKScan. They have been very active in their product development. They tell the number of the amount of the saturated fat per year in the products that have been reduced, and it is amazing. . But then came the idea that in addition to fat, can we change the quality of the fat. I have been involved with them too. The idea was to feed their pigs with special food that has a lot of rapeseed oil. So the fat of the pig changed to less saturated fat and more unsaturated fat, so the quality of the fat got better.”*

As a conclusion, Pekka Puska's influence on food producers encouraged them to shift to healthier products and this didn't reduce their sales levels. He was one of the most important opinion leaders for Benecol who influenced the public perception on functional foods. With his previous efforts in North Karelia Project on lowering cholesterol levels of a population, being a well-known expert in cardiovascular field made people and companies trust him and also trust his recommendations.

## 4.5 Marketing Managers

To better understand the case company's point of view and their activities, an interview was conducted with Susanna Rosin, science and nutrition communication manager of healthy food division in Raisio Group. She talked about the target customer segments, higher sales prices of Benecol due to the special ingredient it contains and how people tend to consume healthy foods once they go to routine check-ups and become aware of their high cholesterol levels:

*“The key target group is people who need to lower their cholesterol through the dietary means. Especially the middle aged and a bit older people. It takes some years to become aware that you may have some risk factors. Also people get their*

*risk factors measured usually at some point in their early middle ages and then they become aware of their possibly elevated cholesterol levels. In the western population, approximately 50 percent of the adult population has elevated cholesterol levels. So it is a big target. We find it important that our products are healthy and ecologically as sound as possible. We pay much attention to the overall nutritional profile of Benecol products so that they are not just products that contain cholesterol lowering ingredient but the whole nutritional profile of the product is good so the product can fit into the nutritional guidelines as well. As for the pricing of the products, our products are always a bit more expensive than regular products due to the specific value of cholesterol lowering effect. ”*

In Benecol’s marketing communication, both consumer and healthcare professionals’ communications are used. According to Rosin, communication towards healthcare professionals is of high importance since these experts are influential and can disseminate the health benefit information of Benecol products to those who have high cholesterol levels and who are in need of using cholesterol lowering products and treatments:

*“Since we have these clear health benefits and a lot of science behind it, we need to educate health care professionals who are those people that meet the people who find out about their elevated cholesterol. Because high cholesterol is something you can't feel but you only become aware of it when you have a blood test taken and then you get the results. And that happens within the healthcare system. So we do also target our messages to the healthcare professionals partly to those who meet patients such as primary care practicing health care professionals but we also work with opinion leaders who are aware of the latest science within cholesterol lowering and influence the opinions of other health care professionals. We have many different kinds of activities towards health care professionals. They can include seminars or any kind of marketing activity. They are then developed and targeted towards that audience so that we inform them and they trust us and understand the benefits of using our products. For example, we are also together with two other companies, joint cooperative member of the European Atherosclerosis Society which is an organization that organizes congresses and educational sessions. We work together with them and also sponsor educational sessions at their congresses so we do have different kinds of activities. ”*

As for the marketing communications in overseas, there are different approaches based on the country healthcare system. The strategy is set based on the features of the healthcare system of that particular country and activities are directed according to these specifications:

*“There are different kinds of healthcare systems in different countries where Benecol products are available. So we then find out what the system is and what our key target groups in that specific country and then we try to target our messages*

*towards those who meet those patients who then are our target group. We just inform them about this way of lowering cholesterol which is also recommended in cardiovascular guidelines. So we think it's our job to keep relevant health care professionals aware of our products so that they can then utilize this tool when they advise their patients in lowering cholesterol."*

Overall view of activities pointed at healthcare professionals presented that it is highly important to train primary healthcare actors for sharing the health benefit of a product with the public. As these actors are the ones who are in close touch with the patients, they can influence the product diffusion. The challenge here might be to convince these professionals to believe in the claimed health effects. Then it is up to healthcare professionals to recommend the product to their patients.

There are many things that influence consumers' purchase decision such as the taste of the product, how they are packaged, how they are marketed, how consumers feel about the image of the company and things as such. In general, both healthcare professionals' communication and direct consumer communication have an impact on the efficiency of marketing, so they complement each other. How much emphasis is put on each type of communication depends on the situation of the country. All in all, having an approved health claim within the European Union for plant stanol esters and also in some other countries where they have their own health claim legislation is very important both in consumer communication and in healthcare professionals' communication, as getting an approval on a health claim for a product is rather difficult and brings a positive brand image to the firms who can obtain this valuable key criteria.

## **4.6 Licensing Partners**

Interviews are conducted with a selected set of Benecol's licensing partners to understand and capture their perspective on making business and growing with an innovative product. The questions are focused to get insights on the motives, goals and interests in the partnership with Raisio to incorporate Benecol products in the product range and how they are aligned with Benecol's strategy. Furthermore, the following themes are discussed:

- Activities and research performed prior to the start of the partnership and the decision process
- Country-specific policies on novel foods and dealing with the regulatory issues
- Marketing and pricing strategy, and positioning Benecol products in market
- Views about the functional food industry, its current state in local market and its potential for future business opportunities
- Consumer awareness on plant sterol and the associated health effects

Next, the interviews with two licensing partners and their views and opinions about the aforementioned topics will be presented.

#### 4.6.1 Olivio USA

The first interview with a licensing partner was conducted with Olivio USA. Olivio is a food manufacturing company and it manufactures spreads and cooking products under the Olivio brand name, and is best known for an olive oil-based margarine-like spread. The interview was conducted with the general manager of the company, George Crocker. Olivio's partnership with Raisio started on 1<sup>st</sup> December 2016 and since then it is the main distributor of Benecol products in USA.

As the consumers' food preferences are different in USA, and American consumers tend to eat less fat spreads, Olivio made some product adjustments on the content of its Benecol spread. George Crocker explains the changes in the products to fit the consumer needs:

*“If Becel Proactiv has 1 gr of plant sterols, our Benecol products had 0.5 gr of plant stanols in the beginning. Therefore, we increased the amount of the plant stanols in our products to make it more effective in lower amounts of daily consumption. Consumers in United States do not consume fat spreads as much as the consumers in Finland. If the consumption of the spread is around 2 tablespoon per day in Finland, it is one third of a tablespoon in United States. They don't eat margarines in US so we came up with new products such as chocolate chews and coffee cream (Nondairy). We need to focus on the products that is consumed more on a daily basis.”*

As it can be seen from the Olivio's product development strategy, the efforts are more directed to the products that are consumed widespread. Instead of focusing only on the margarines product range which is claimed to be not profitable in USA due to the insufficient consumer awareness, they tried to penetrate the market with new products that they internally developed with Raisio's patented special ingredient, plant stanol ester, and used these products only in that specific country. As coffee creams and chocolate chews seem to be more appealing to the US consumers, a mix in the product range seems to be the best strategy for Olivio.

Crocker explains that acquiring new customers and making them buy and consume more of their products is a challenge. When the ingredient royalty fees are high, this should be compensated with higher sales which is not the case for Olivio. He shares his views on customer acquisition costs and return on investment issues:

*“People in United States don't care about eating healthy. People's perception is relatively simplified and they focus more on the fat rates, or calories when they purchase something. Young generation (18-30) is more focusing on food quality.”*



*Problem is how to economically grow the market because winning a customer is a challenge and it creates costs. In Benecol's royalty model, ingredient price is expensive. Raisio might do the marketing activities themselves to attract more customers. Because when one customer costs 25 USD and when they buy the product once a year, it is not profitable enough. Return on Investment is uncertain and it is the main problem. The customer acquisition costs should be lower and consumers need to buy the products more."*

It is possible to claim the cholesterol reduction by 10% in European markets but this is not allowed in USA. FDA claims that 2 grams of stanol and sterols may reduce the cholesterol levels. As different type of products are more appealing to the consumers in different countries due to the cultural differences, innovator companies might need to reconsider their strategies and help licensing partners for new product development activities in specific countries. Support from innovator firms might be needed for either new product development activities or marketing activities to allow the licensing partners to focus more on one of these aspects for more effective consumer awareness.

#### **4.6.2 Kalbe Nutritionals Indonesia**

Kalbe is one of the biggest pharmaceutical company in South East Asia and Kalbe Nutritionals is the subsidiary of Kalbe Group. Kalbe Nutritionals is an Indonesian brand, which is active in healthy food and drink business. The goal of the company is to provide healthy products for people regardless of the age of the person. Their mission is to meet the nutrition requirements of active women and breastfeeding mothers, to support children's early stage of growth and development, to improve adults' and elders' quality of life, and to support teens' and modern professionals' healthy lifestyle. They have several products in their product range to meet their goals. In order to capture their perspective on making business with Benecol and their marketing activities, an interview was conducted with Donny Bambang Iryanto, the business unit head of Kalbe Nutritionals.

Kalbe Nutritionals' partnership with Raisio and Benecol started in 2008 and since then, no other competitor entered to functional food business in Indonesia, making Kalbe Nutritionals the market leader in their area. He explains the vision and mission of the company, the reason behind the partnership with Benecol, as well as their mindset of providing healthy foods for people from womb to tomb in his words:

*"The vision of Kalbe is to create and bring wellness to Indonesian people with its nutritional products and our vision is to strengthen the vision of Kalbe in the same context. Our mission is providing our products in each of the citizens' home. If we talk about our product range, we can describe it as from womb to tomb. Basically, we have nutrition for pregnancy period for women and the baby. After that, we provide nutrition for infants, teenagers, young adults, adults, seniors, and also special nutrition for people who have diabetes. Benecol concept and proposition*

*matches and fits exactly to Kalbe Nutritionals' mission. As cholesterol is one of the primary causes of coronary heart disease, we want to provide wellness in terms of cholesterol problem. This is why we see that it is very important to have a partnership with Benecol. Since plant stanol ingredient of Benecol is acknowledged by institutions, healthcare professionals, and medical bodies and have the exclusivity, we wanted to use Benecol brand in our cholesterol lowering business.”*

In Kalbe Nutritionals case, the main driver of starting a partnership with Raisio and incorporating Benecol products in the product range was the uniqueness of the ingredient. Having the approval from reputable regulators for claiming health benefits of plant stanols enabled Benecol to become an appealing brand, since it is the only brand that can use and contain plant stanols.

According to Iryanto, the competitive environment in functional foods in Indonesia doesn't seem very tough. Kalbe Nutritionals is the only company in Indonesia that provides cholesterol lowering functional foods. There are few local brands using plant sterols in their products under supplement category and they are also claiming cholesterol reduction. However, these local brands are not permitted to claim the cholesterol reduction by percentage and cannot recommend the amount and duration of consumption, which gives an advantage to Kalbe Nutritionals as they can use the health claims on their smoothie, cereal, and latte Benecol products. Iryanto explains their advantage over their competitors and the increased consumer awareness after getting the permission for health claims in 2014:

*“We are the only company in Indonesia that performs campaigns and educates people about the role of plant stanol ester. Non-direct competitors usually talk about beta-glucan or soluble fiber. There is no other global brand that exists in Indonesia in functional foods. After 2014, we have been able to claim the cholesterol lowering effect on the packaging and due to that, people are now more aware that plant stanol ester helps lowering cholesterol by 10% in 2 to 3 weeks. We can say that around 60% of Indonesian adults with the age of over 25 is already aware of NutriBenecol. In terms of purchase, 10-15% of the people who are aware of the brand usually buy Benecol at least for one month. We still need to educate them because Benecol is not like medicine. ”*

The role of opinion leaders in Indonesia is divided between the government and healthcare institutions. Ministry of health and several opinion leaders in different locations that spread around the islands undertake the task of disseminating the health benefit information to healthcare professionals and public. They emphasize the prevention of non-communicable diseases and the cholesterol reduction. In order to draw attention to this issue, Kalbe Nutritionals started an initiative 3 years ago where they explain the ways of lowering cholesterol which would result in the prevention of coronary heart disease:

*“One out of three Indonesian people has high cholesterol. In health insurances here, the biggest spent comes from the heart diseases. In the last 3 years, we have been conducting a campaign called Indonesia fight cholesterol and we reached 75000 people, which was also published in social media. We have been supported by the doctors and cardiovascular associations, as well as health minister. However, some of the key opinion leaders don't want to be seen that they are supporting certain brands. In order to communicate our Benecol products here and to be supported by opinion leaders, we brought government, as well as ministry of health into the picture. Since Indonesia consists of thousands of islands, big islands usually have their own institutions and key opinion leaders. We need to get in touch with several key opinion leaders in several institutions in those different locations. Knowing each of the key opinion leader and building relationship with them is important.”*

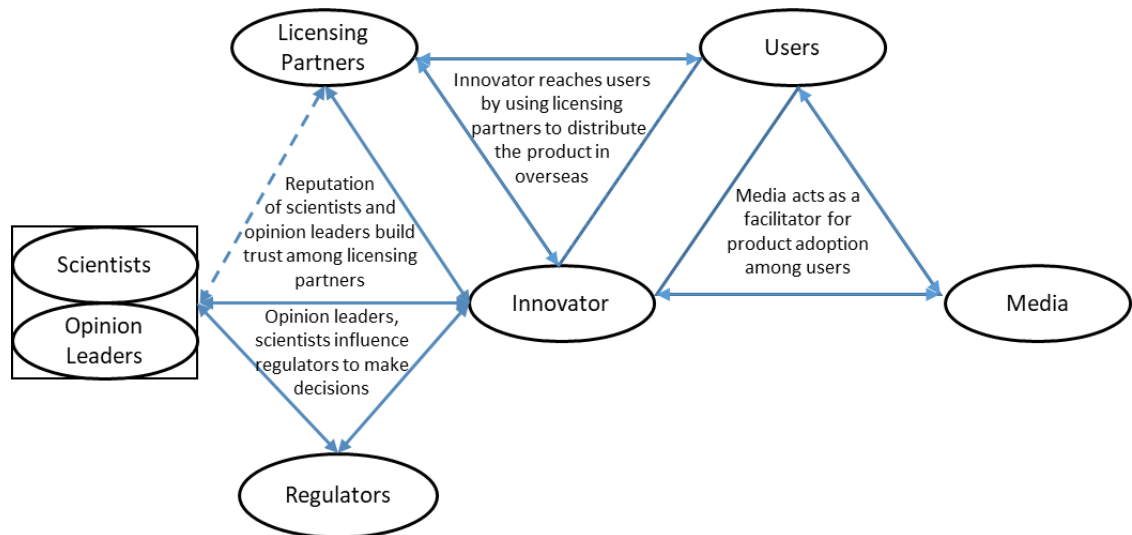
As people in Indonesia tend to consume products in liquid form rather than in solid form such as margarines, Kalbe Nutritionals focus has been on the liquid products over the years. Among Indonesian people, it is still not common to use margarine nor olive oils. Iryanto points out that in Indonesia, functional foods are still in the early stage, and Yakult and Benecol are the biggest players in the market. He states that functional foods will still play a key role in the healthy lifestyle of Indonesian people and business opportunities are compelling.

## 5. SUMMING UP RESULTS AND DISCUSSION

The research and interviews are conducted to provide answers to the research questions that are presented in the thesis. The research questions are aimed to discover the relevant stakeholders affecting the commercialization outcomes of an innovation, to discover the activities they perform for several purposes, and to find out their motives, goals and interests in their collaboration with relevant actors. In order to study the influence of stakeholders on success of commercialization of an innovation, case study method was used and relevant actors around the case company in functional food industry, their activities and their motives were analyzed. Four sub-questions are answered throughout the thesis, backed with theoretical and empirical research. The sub-questions are:

- *Who are the relevant stakeholders that can contribute to commercialization?*
- *What kind of activities do stakeholders employ for effective commercialization?*
- *What are the motives of stakeholders to be involved in along commercialization?*
- *How stakeholders and their activities are interconnected?*

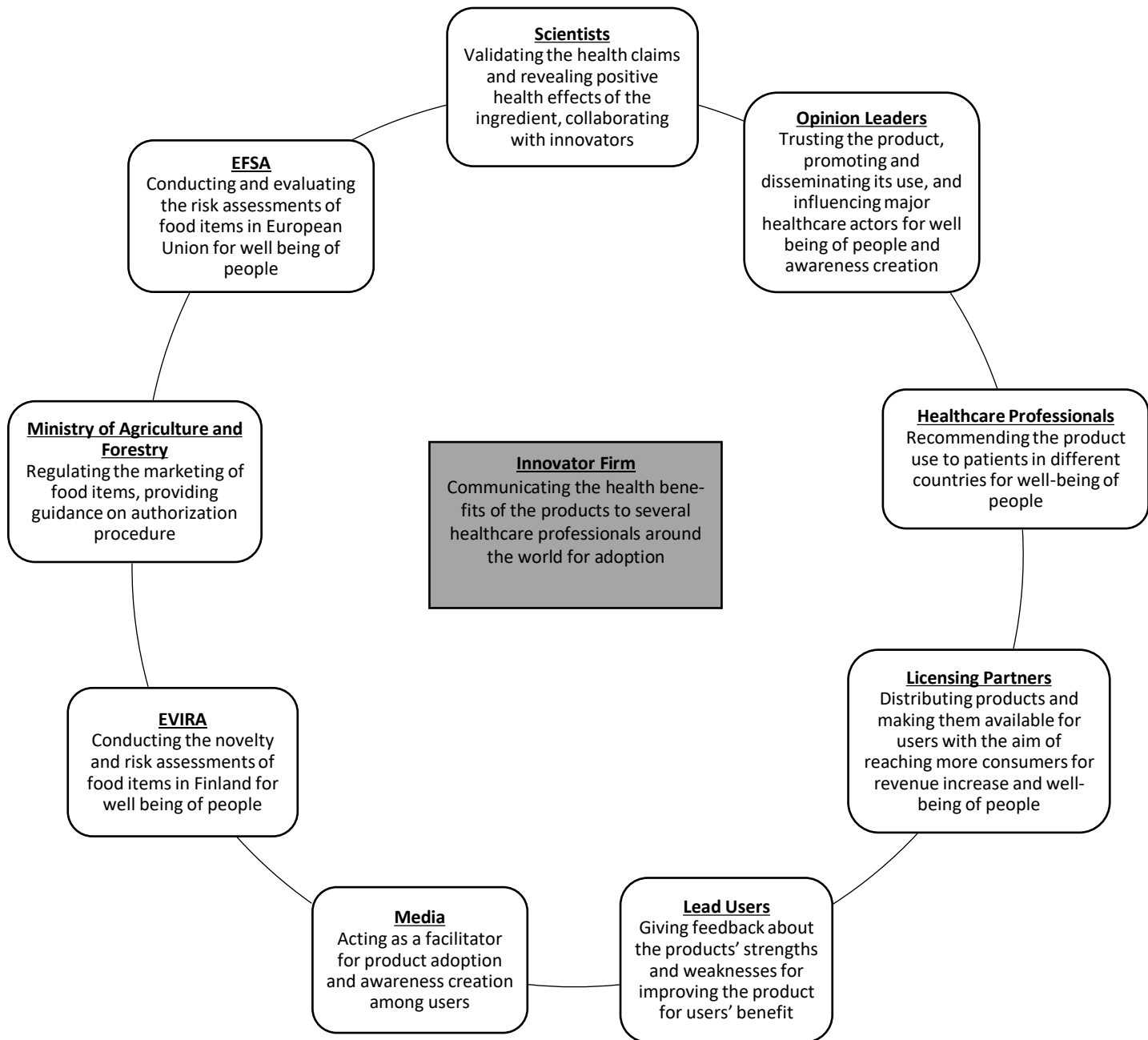
The case study results show that commercialization of an innovation in functional food industry requires activities from various stakeholders, including regulatory bodies (Ministry of Agriculture and Forestry, Evira, European Food Safety Authority), research organizations (VTT), primary healthcare professionals in different countries, opinion leaders (e.g. leading doctors having opinion leader status in the focal context), scientists and licensing partners (e.g. Olivio USA, Kalbe Indonesia). Interactions between them are illustrated in Figure 12 below.



**Figure 12.** *Interactions between actors.*

Involving all stakeholders from the public and private sectors to academia and civil society is a requirement for companies who want to successfully commercialize their products. In our case, innovator company has been actively involving the actors for the diffusion of the innovation. Licensing partners are in close touch with the users by promoting the products. Innovator company uses media to reach users. Opinion leaders and scientists influence regulators to make decisions and they inform them about the scientific validity of the innovation and the public preference. Apart from these actors, the role of media and lead users can't be ignored. Mass media is one of the most effective tools to help an innovation to diffuse. The fourth industrial revolution we have been experiencing is digitalizing and changing the way we interact with products, people, machines and recent developments daily. The use of social media and digital marketing practices is having considerable impact on the diffusion of innovations. The rapid advancements and evolution of the systems are causing disruptions almost in every industry and in every country, which is constantly changing the physical, digital, and biological ecosystems with an exponential growth. Companies are forced to adapt to new patterns of consumer behavior to market and deliver products and services.

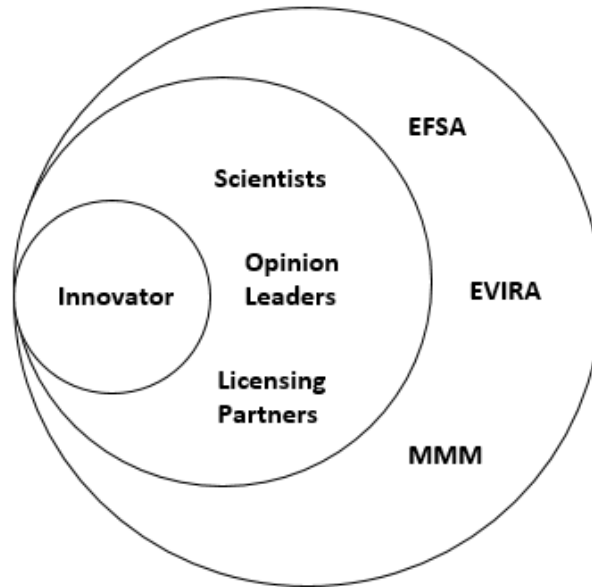
In functional foods industry, these stakeholders perform activities such as drafting new legislation and food labelling for health claims, conducting safety assessments, ingredient or product development, conducting surveys to find out consumers' food preferences, communicating health benefits of the product to several actors for adoption, and gaining the trust of healthcare professionals and patients. This study revealed that the motives of such activities are ensuring well-being of people, creating new business ecosystems, contributing to the economy, and creating awareness among public towards a healthy diet and lifestyle, which facilitate the emergence of a market. The stakeholders, their activities and motivations are illustrated in Figure 13 below.



**Figure 13.** Main stakeholders around the innovator firm in functional food industry in Finland.

In this case study, in the later stage of commercialization process, the innovator firm have closer relationships and collaboration with the scientists, opinion leaders, and licensing partners with the aim of distributing the innovation to various geographies and maintaining a robust position in foreign markets. Although regulators have an important role in the value chain and affect the processes by forming regulations and legislations, they usually act as an outside influencer who do not have constant communication and interaction with the innovator firm in the later stage of commercialization. This is due to the emerging presence of Benecol in foreign countries in which the licensing partner is responsible for registering the product and communicating with the authorities. However,

in the beginning phase of commercialization, the role of regulators is crucial and it is necessary for innovator firms to communicate with regulators regarding the requirements of country policies when launching and marketing a product. The proximity between innovator and actors in the later stage of commercialization is illustrated in Figure 14 below.



**Figure 14.** *Proximity between innovator and actors in functional food industry in Finland.*

In this case study, EFSA, EVIRA, and MMM acted as the major regulatory forces, since the innovation is originated in Finland and EVIRA and MMM are the organizations that are responsible for the legislative matters and risk assessments in Finland. Scientists and opinion leaders acted as disseminators in terms of educating the healthcare professionals and public in Finland and also in many countries. They contributed to the scientific research and revealed the medical effects of the ingredient. They gave speeches in seminars and conferences around the world to present the health benefits of the ingredient and to address the importance of an active lifestyle, which promoted the innovator firm's cause of providing a healthy living and reducing cholesterol. Licensing partners incorporated Benecol products in their product range with the constant support and guidance from the innovator firm in terms of ingredient, data, ideas, and problem solving. These activities and achievements facilitated the diffusion of the innovation throughout the world and made the innovation one of the most successful examples in functional food category. The research questions of the thesis, the stakeholders involved, their activities, motives, and the interactions between them are listed in the Table 11 below.

**Table 11.** *Answers to research questions.*

	<b>Regulators</b>	<b>Opinion Leaders</b>	<b>Innovator</b>	<b>Licensing Partners</b>	<b>Scientist</b>
RQ1 - Who are the relevant stakeholders that can contribute to commercialization?	<ul style="list-style-type: none"> <li>Ministry of Agriculture and Forestry</li> <li>EFSA</li> <li>EVIRA</li> <li>EU Commission</li> </ul>	Pekka Puska and other individuals, organizations abroad	Raisio	<ul style="list-style-type: none"> <li>Olivio USA</li> <li>Kalbe Nutritionals Indonesia</li> </ul>	Helena Gylling
RQ2 - What kind of activities do stakeholders employ for effective commercialization?	<ul style="list-style-type: none"> <li>Regulating the marketing of a food product</li> <li>Providing guidance to the manufacturers on the authorization procedure</li> <li>Conducting and evaluating risk and safety assessments</li> <li>Ensuring the validity of the health claims</li> </ul>	<ul style="list-style-type: none"> <li>Trusting the product, promoting and disseminating its use by cooperating with manufacturers, and influencing major healthcare actors</li> <li>Attending the seminars and conferences worldwide to give speeches about the health benefits of the ingredient</li> </ul>	Communicating the health benefits of the products to several healthcare professionals around the world for adoption	Distributing products in overseas and making them available for users	Validating the health claims and revealing positive health effects of the ingredient, collaborating with innovators
RQ3 - What are the motives of stakeholders to be involved in along commercialization?	Well being of people as the health is a concern in functional food products	Well being of people and improving healthy lifestyle of a population	Well being of people as well as worldwide product adoption	Well being of people and reaching more consumers for revenue increase	Well being of people, contributing to the scientific field they are involved in with the collaboration with innovators
RQ4 - How stakeholders and their activities are interconnected?	Regulators are in close touch with innovators in the beginning stage of commercialization to ensure that ingredients comply with the guidelines	Collaboration with food manufacturers for reducing the fat content created awareness among public towards a healthy diet, which increased the credibility of Benecol	Being a central focal actor in the network, innovator orchestrates the members of the ecosystem by continuous information flow	Constant communication between licensing partners and innovator provides improved management and marketing practices	<ul style="list-style-type: none"> <li>Contribution from scientists helped innovator company to obtain the approval of health claims from regulators</li> <li>The revealed positive health effects of plant stanols enabled innovator company to increase the product's sales price against its competitor</li> </ul>



Users of the innovation can also contribute to research and development activities by giving feedback about the products' strengths and weaknesses. It is emphasized that the competence to involve the right users at the right time in the right form is a valuable asset for innovator firms. However, these users must have a high motivation toward new solutions, they should be open to new technologies, and they should be embedded into a supportive environment (Lettl, 2007). It is pointed out that the users can be also innovators when they are in need of the products or services that are not yet available in the market conditions. Therefore, these users take the initiative and come up with their own solutions, which results in an innovation that might disrupt current technologies. It is stated that their motivation to innovate comes from the high benefit the solution would provide. In order to be successful when coming up with a new user innovation, following patterns are emphasized (Hienerth & Lettl, 2011):

- Need for a new solution
- Exploring the community
- Building a micro community
- Leveraging the micro community
- Tapping into the macro community
- Early market development
- Emergence of standard equipment

It can be seen that community plays an important role in opportunity evaluation and development of a new innovation. The lead users share their ideas with their peers in the community to get feedback. By doing this, the user innovators can evaluate their ideas and make modifications to meet the needs. Lead users address niche segments instead of larger market segments unlike mass market manufacturing firms, as the innovation ideas mostly appeal to other early adopters who have more specific needs and are encountering more problems than an average user. As the close community members get involved in the process who have technical and required skills for the innovation to be developed, a micro community starts to take shape around the innovation ideas. However, it is noted that the higher reputation of a lead user influences community members positively and generates bias to give feedback on their ideas, which might inhibit the diffusion of a potentially successful idea of an unknown lead user (Hienerth & Lettl, 2011). When promoting the innovation in the community, the community members should be familiar with the idea and they should understand the need. This helps an innovation to advance to the next level.

One of the most serious barriers for user innovations to diffuse is lack of funds and small market segments. These barriers hinder the innovation to advance to the early majority segment, which might be as well called crossing the chasm problem. In Hienerth and Lettl's study (2011), it was pointed out that these challenges can be overcome by proving the superiority of the innovation by personally using them. In addition to that, once the opinion leaders and early adopters start to use the innovation, this helps the innovation to

draw attention and diffuse into larger segments in the community, which easily creates a pull effect.

## 6. CONCLUSIONS

### 6.1 Theoretical Contribution

This study contributes to marketing and innovation management literature by developing knowledge on the relevance of diverse stakeholders in commercialization. The study also generates practical advice for managers who market and commercialize (radical) innovations, beyond food innovations and a functional food industry. Findings have validated and contributed to the existing studies (Mark-Herbert, 2004; Matthyssens et. al., 2008; Öberg & Shih, 2014; Aarikka-Stenroos et al., 2014; Hillebrand et. al., 2015; Granqvist & Ritvala, 2016) that overly strict boundaries and regulations delayed the advancement of the functional food innovations. It also validates the research on how functional food innovations should develop over time in terms of managerial methods and creating added value. As it was studied, collaborative agreements, alliances and partnerships facilitate the progress of the innovation and help its dissemination in the world. This study supports that different types of actors influence each other in a commercialization process by sharing goals and getting involved in collaborative agreements, and that stakeholder marketing capabilities have an impact on organizations' performance in the long-term and the impact is indirect.

Benecol's distribution around the world highly relies on the involvement of scientists' and opinion leaders' activities on ingredient experiments and revealing the positive health effects, as well as the communication of these health benefits in various conferences. It also depends on regulatory bodies approving the product in target markets, healthcare professionals educating the patients and endorsing this way of treatment, licensing partners distributing the products in their local markets to make the product available to users, and users adopting the product. Therefore, stakeholder marketing recognizes that customer relationships may be influenced by relationships with other stakeholders and that a diverse stakeholders co-creates value (Gummesson, 2008).

The research addresses market-creation related challenges that organizations come across throughout the commercialization process such as regulatory issues, and influencing consumers proactively to raise attraction to the novelty. It emphasizes the importance of sustained collaboration between actors.

### 6.2 Managerial Implications

The research findings indicate that the focus of the activities should not only on research and development, but resources must be allocated to commercialization activities as well. In the beginning stage of commercialization of an innovation, managers should be in close contact with regulators to comply with the ingredient usage and packaging regulations.

The recommendations and guidelines of the relevant regulatory bodies should be followed in order to experience a smooth and delay-free process of ingredient or product registration. In order to have a well-established position in the market, structured, systematic preparation and research about the markets, competitors, related actors that would be beneficial for the dissemination of the innovation should be studied in advance. Active collaborations with research organizations, scientists, and opinion leaders have an important role on creating credibility and building an image of a successful brand. Managers should note that diffusion of a radical innovation is not an easy task and it requires active involvement and contribution from various stakeholders. The key point here is to involve these stakeholders well in advance and to share the same goals and interests. In order to be on the same page with stakeholders that are considered to support the diffusion, open communication, and setting the common goals and mutual interests are important. The findings of this study indicate that when stakeholders have the same or similar motives for performing an activity and share the same goals, the outcome becomes more beneficial and satisfactory for all the parties involved.

Partnerships with licensing partners in different countries would help innovator firms to diffuse in foreign markets with the help of their local partners who know the habits and preferences of the consumers. Managers should be aware that feedback from licensing partners on management and marketing practices, and new product activities would enhance the communication between two parties and might introduce new ways of doing business and task partitioning. Especially when entering a new market, regulations of the market should be well studied. Communication and constant information flow between licensing partners and the innovator company is essential and should not be neglected. As the TV and newspaper usage is dramatically diminishing in the recent years with the shift to smartphones, using digital solutions such as search engine optimization, Google AdWords, and Facebook Ads for marketing purposes should be considered to reach consumers, as they provide a massive database of users which would enable innovator firms to convey their causes.

### **6.3 Limitations and Future Research**

This study explores the activities and motives of the major stakeholders that influence commercialization outcomes around an innovator firm in functional food industry. One limitation might be that the significance level of the key stakeholders might differ in other industries. Since there are many other type of minor stakeholders that have effect on the commercialization process at some degree, their activities and motives can be examined further. These stakeholders can be discovered through the interviews with other key managers in the innovator firm, and an extensive web search can be conducted to identify the stakeholders in a longitudinal study. As the successful commercialization of a functional food innovation highly depends on multiple factors including the opinion leaders' and healthcare professionals' recommendations, identification of these key actors in different

geographies through licensing partners and conducting interviews to examine their impact on consumers' buying decision process would provide broad insights on the case.

Although media and digital marketing practices have an important role on influencing customers' purchase decisions, the interviewees could not provide adequate and fruitful discussions on the matter due to their administrative positions and lack of knowledge about the marketing activities in general. The expansion of the qualitative interviews and their analysis would provide a more comprehensive, in-depth overview on the impact of the commercialization activities. In addition to this, the price difference of two major food product in cholesterol reduction category can be analyzed in more detail, which are Becel Proactiv and Benecol. The findings indicate that this price difference is caused by the conversion process of sterols to stanols. In order to derive stanols, a chemical conversion process is needed, which incurs costs and as a result, this reflect on the sales price. Even though the cholesterol lowering effect is almost at the same levels for both products, there is a substantial price difference between them. A user survey can be conducted to find out the reasons and drivers for choosing one functional food product over another to learn more about the consumer awareness and their preferences, which would also complement the research by adding the user point of view as another stakeholder category. Cost structure of Benecol margarine can be analyzed further to find out the factors that increase its price compared to its major competitor Becel Proactiv. In addition to these, as there is a new novel food regulation in EU, how regulators shape manufacturers' innovation activities present an interesting area for further research.

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